JANAPADODHWAMSA / MARAKA VYADHI

PAGE NO. :
DATE : / /

Epidemic Diseases (Amendment) Ordinance Act 2020

- The EDO Act 2020 was Established on April 22, 2020
- The Act provides for the prevention of the Spread of dangerous Epidemic disease
- The Act include protections for healthcare personnel Combating Epidemic disease and Expands powers of the Central Govt to prevent the Spread of Such diseases.

Key features of EDO Act, 2020

1. Protection of Healthcare Professionals:

- Amendement provides Strict penalties for violence againt Healthcare workers (i.e Doctor, Nurse, Paramedics, Etc)

2. Definition of Violence

- Violence is defined to include harassment, Harm, injury, intimidation & obstruction of Healthcare workers during their duty.

3. Punishment & fines

Punishments = 3 months to 5 years imprisonment
fine = 50,000/- to 2,00,000

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4. Compensation for Damages

Compensation amount is determined based on the Cost of damage or loss

5. Speedy investigation & trial

Act Ensures that - Cases are investigated within 30 days
- trail proceeding Completed within 1 year

6. Applicability : It is applicable during the notification of any "Epidemic" under ECO Act 2020

7. Central Govt's Role :

Act empowers the Central Govt to regulate the inspection of ships & vessels during an epidemic to restrict the spread of infectious diseases

* It Came into force during COVID-19 pandemic and addressed widespread reports of violence against medical professionals.

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

जनपद - Group of people living in specific location
उद्ध्वंस - means destruction

PAGE NO. :
DATE : / /

* Janapadodhwamsa / Maraka vyadhi

Cause of Janapadodhwamsa / Maraka vyadhi

The disease which produce destruction of large population is called Janapadodhwamsa & it is caused by. (नियत & अनियत हेतु)

(unavoidable / definitely happen)

नियत हेतु :- • They are inevitable disastrous factors. Include
• They include वायु (air), उदक (water), देश (Place) and काल (time), सूर्य, चन्द्र, नक्षत्र & ग्रहों's etc.

(avoidable)

अनियत हेतु :- • They are evitable disastrous factors.
• They include:
प्रज्ञापराध (terrorism, accidents, etc)
शस्त्र प्रभावज (Wars with nuclear weapons, missiles, etc)
अभिषङ्गज (effects of pathogens, evil forces, etc)
अभिचारज (Curse)

All these factors not only influence the individuals but also the society leading to destruction of community.

(factors) Manifestation of Janapadodhwamsa

वायु (Air)
उदक (water)
देश (Place)
काल (time/season)

} Vitiation of these factors leads to the simultaneous manifestation of disease leading to destruction of country.

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Nature of Vitiated factors

1. वायु (Air) :
   - अतिस्थिमितम् - Excessive Calmness
   - अतिचलम् - Excessive Blowness
   - Excessive dryness
   - Excessive Heat & Cold air
   - Excessive clashes among each other wind blowing on either direction
   - Associated with unwholesome smell, gases, sand, ash & smoke

2. जल (water) :
   - Polluted water with Abnormal smell, Colour, taste & touch
   - Excessive stickyness
   - Reduction in the no. of aquatic animals
   - unpleasantness

3. देश (land) :
   - Having Abnormal smell, Colour, taste & touch
   - Excessive moisture
   - Having Excess of grass & weeds
   - Excessively branched Creeps
   - water reservoir are continously flowing.

4. काल (time) :
   - Too much Cold in winter
   - Too much Heat in Summer
   - Rain in Summer
   - Cold in Summer

PAGE NO. :
DATE : / /

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

Control of Janapadodhwamsa

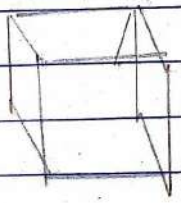
- Truthfullness
- Compassion for living beings
- Prayer to the gods
- Adoption of preventive measures
- Protection of the self by Mantra
- Constant association with religious
- charity
- Sacrifies
- tranquillity
- observance of Brahmacharya
- Residance in auspicous localities
- Have self Control

Importance of Panchakarma and Rasayana for preventing Janapadodhwamsa

Janapadodhwamsa Vikara are prevented even all these four vitiated factors are at work. if he is administrating medicines properly.

Those who are not having पापकर्म during previous life and those who are not destined to die during Janapadodhwamsa for their cure पंचकर्म's are Best

They should be properly administered रसायन चिकित्सा along with पंचकर्म and maintain Phyical Health should be performed



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* Epidemiology

Definition:-

- Epidemiology is the study of the distribution and determinants of health-related states or events (including diseases) and the application of this study to control of diseases and other health problems among defined population.

- Situation involving the destruction or death of a large populations spread over a small locality, or a country or a part of world or even the entire world

Principles & uses of Epidemiology

Principles:-

1. To know the distribution of the disease in the community
2. To know the magnitude of the problem
3. To identify the etiological & risk factors in development of disease
4. To plan for the implementation of prevention & control measures
5. To eliminate or eradicate the disease
6. To evaluate the control measures
7. Ultimate objective is to promote the Heath & welbeing of people

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO.:
DATE: / /

Uses of Epidemiology

1. To study Historically the rise & fall of diseases in population

2. To monitor continually over a period of time & the change of Heath in a Community.
   Eg:- effects of - Vaccination programme, Health education, Etc

3. To make a Community diagnosis
   Eg:- Nutrition status of children

4. Planning and evaluation

5. Evaluation of individual's risks and changes

6. Syndrome identification

7. Completing the natural History of disease

8. Searching for Causes and risk factors.

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* Basic terms of Epidemology

1. Infection:

The entry and development (or) multiplication of an infectious agent in the body of man or animals.

2. Contamination:

The presence of infectious agent on a body surface, also on or in clothes, beddings, toys, surgical instruments, or other substance including water, milk & food

3. Infestation

For person or animals the lodgement, development and reproduction of anthropods on the surface of the body or in clothing (Eg:- lice, itch mite)

4. Host

A person or other animal including birds and anthropods that affords lodgement to an infectious agent under natural condition

5. Communicable diseases

Illness due to specific infectious agent capable of being directly or indirectly transmitted from Man to Man, Animal to Animal or from the Environment to Man or Animal.

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

6. Epidemic

unusual occurance or sudden outbreak of disease in a Community or region.

7. Endemic:

Constant presence of a disease or infectious agent within a given geographic area or population group

8. Sporadic

Sporadic means Scattered,
Diseases which are few & separated widely in space.

9. Pandemic

An epidemic usually affecting a large proportion of the population, Occuring over a wide geographic area such as section of Nation or whole Nation.

10. Zoonosis

An infection transmissible under natural conditions from Vertebrae animals to man.

11. Eradication

Termination of all transmission of infection by Extermination of infections agent through Surveillance & Containment.

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12. Carriers:

A Carrier is defined as "an infected person or animal that Carries a specific infectious agent in the absence of clinical manifestation but potentially source of infection.

13. Incubation period

The time interval between the attack of an infectious agent and appearance of the first sign or symptom of the disease"

14. Generation time

The time interval between Contact of infection by a host and maximal infectivity of the host

15. Communicable periods

The time during which an infectious agent may be transferred directly or indirectly from an infected person to another person, from an animal including athropods.

16. ~~Communicable~~ Secondary attack rate

No. of Exposed persons developing the diseases within the range of the incubation period following Exposure to the primary Case

17. Immunity :- Protection againt Infections.

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO.:
DATE: / /

18. Immune System : Molecules, cells & tissue that mediate responses to foreign substances.

19. Antigens : Substances recognized by the cells & molecules of the immune System & to which the System responds.

* DYNAMICS OF DISEASE TRANSMISSION

- Communicable diseases are transmitted from the Reservoir/Source of infection To Susceptible Host.
- Chain of transmission :- 1. Source / Reservoir of infection
  ↓
  2. Modes of transmission
  ↓
  3. Susceptible Host.

Source / Reservoir of Infection

Source of Infection : Person, animal, object or substance from which an infectious agent passes to the Host

Reservoir of Infection : Person, animal, arthropod, Plant, Soil or Substance in which it depends primarily for Survival and reproduce itself & transmitted to Susceptible Host.

Types of Reservoir :- 1. Human Reservoir
2. Animal Reservoir
3. Reservoir of infections in non-living things

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Human Reservoir

CASES
- Primary Case
- Index Case
- Secondary Case

CARRIER
- Type
  - Incubatory
  - Convalescent
  - Healthy
- Duration
  - Temporary
  - chronic
- Portal of Exit
  - urinary
  - Intestinal
  - Respiratory.

Modes of Transmission
(Routes of transmission)

Communicable diseases may be transmitted from the reservoir/ source to the susceptible host in many different ways.

Mode of transmission

Direct transmission
1. Direct Contact
2. Droplet infection
3. Contact with soil
4. Contact with animals
5. Transplacental

Indirect transmission
1. Vehicle borne
2. Vector borne
3. Air borne
4. Formite borne
5. Unclean hands & fingers

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

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DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

Direct transmission

1. Direct Contact :- transmitted by direct contact from skin to skin, mucosa to mucosa
   Eg:- skin to skin - touching, kissing
   Sexual intercourse - STD, AIDS

2. Droplet Infection : direct projection of a spray of droplet, saliva, & Coughing, Sneezing, spitting into surrounding atmosphere
   Eg:- fever, Common Cold, tuberculosis, etc, RTI.

3. Contact with Contaminated Soil :- disease agent may be inoculated direcly into skin or mucosa
   Eg:- Dog bite, Virus through Syringes & needles

4. Contact with animals : Rabies transmitted from a rabied animal by bite

5. Transplacental : infectous agents passes through placenta to foetus
   Eg:- Rubella, Syphilis, HIV

Indirect transmission — 5F's (flies, finger, fomites, food & fluid)

1. Vehicle borne - Infection spread through vehicle like water, food, ice, blood, Serum, Plasma, Etc
   Eg:- diarrheas, typhoid fever, cholera, Polio, Hep-A

2. Vector borne - Arthropod or any living Carrier the infectious Organisms
   Eg:- Malaria, filaria, Dengue, mice, etc

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3. Air borne :- Droplet nuclei - they are type of particles implicated in the spread of air borne infection
Eg:- Tuberculosis, Pneumonia, Q-fever

Dust - Eg:- streptococci, viruses & fungal spores

4. Fomite borne :- Fomites are non-living articles or substance other than water & food Contaminated by infectious agents discharge from Patient to Healthy
Eg:- clothes, towels, Hand Kerchief, Cups, Spoons., Etc

5. Unclean hands & fingers :- Hands are the most Common medium by which pathogenic agents are transferred from Hands to food, Nose, skin Etc
Eg:- streptococcal infections, dysentery.

* THEORY OF DISEASE CAUSATION.

- Supernatural theory of diease
- Germ theory of disease
- Epidemiological Triad
- Multifactorial theory

Supernatural theory of disease :-

In the Early Past, disease was thought mainly due to either Curse of god (or) due to the evil force of the demons.

DATE : / /
PAGE NO. :

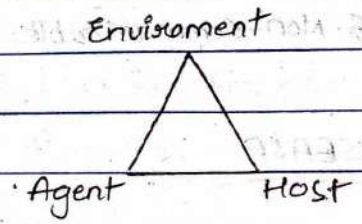
Scanned with ACE Scanner

PAGE NO. :
DATE : / /

Germ theory of diseases (Louis Pasteur, Robert Koch)

Microbes (Germs) were found to be the cause for many known diseases

* EPIDEMIOLOGICAL TRIAD (रोगशास्त्र त्रय)



- Causative factor of disease may be classified as AGENT, HOST & ENVIRONMENT.
- These three factors are transferred as Epidemiological triad.
- The presence of Agent, Host & favourable environment factors in the pre pathogenesis period is not sufficient to start the disease in man But Combination of these 3 factors initiate the disease process in Man.
- Combination of Epidemiological triad denotes
  - Distribution of disease
  - Cause of disease
  - Nature of disease
  - Endemic or Epidemic
  - Risk factor of disease

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- Epidemiological triad helps in preventing the disease
  - at primary level : through Health promotion & Specific protection
  - at Secondary level : through Early diagnosis and Treatment.

- The Knowledge of Epidemiological triad is very much useful in Prevention of Communicable & Non-Communicable disease.

* NATURAL HISTORY OF DISEASE

- It means the evolution of a disease process in an individual, from its early stage to final stage of recovery or death, in the absence of any intervention such as prevention or treatment.

- This differs from disease to disease & from Person to Person

- Understanding the natural history of disease is Essential Because Knowledge of prevention can be applied at different phases of the disease process.

- Stages in Natural History of disease

1. Pre-Exposure stage	} Primary prevention
2. Pre-Clinical stage	
3. Clinical Stage	} Secondary Prevention
4. Resolution Stage	} Tertiary Prevention

PAGE NO. :
DATE : / /

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

1. Pre-Exposure stage:
- Factors present leading to problem development

↓

2. Pre-clinical stage:
- Exposure to causative agents
- No symptoms present

↓

3. Clinical stage
- Symptoms present

↓

4. Resolution stage:
- Problem resolved
- Returned to Health or) chronic state (or) Death

* CONCEPT OF PREVENTION

The Concept of prevention is best defined in the Context of levels, traditionally called Primary, Secondary and tertiary prevention. A fourth level, called primordial prevention, was later added.

level of prevention -

Preventable Cause of Disease (BEINGS) -
- Biological factors & Behavioural factors
- Environmental factors
- Immunologic factors
- Nutritional factors
- Genetic factors
- Services, social & Spiritual factors.

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1. Primordial Prevention

- Primordial preventions consists of actions & measures that inhibit the emergence of risk factors.
- It is the prevention of the emergence or development of risk factors in countries or population groups in which they have not yet appeared.
- Eg:- Many adult health problems (i.e obesity & hypertension) have their early origins in childhood due to Harmful lifestyles (i.e smoking, eating patterns, etc)

Therefore in primordial prevention, discouraging childrens from Harmful lifestyle

- Main INTERVENTION in primordial prevention is through individual education & mass education (In schools & colleges, etc)

2. Primary Prevention

- Primary preventions can be defined as the actions taken prior to the onset of disease, will removes the possibility that the disease will ever occur.
- Primary prevention may be accomplished by measures of INTERVENTON "Heath promotion" and "specific protection"
- Measures - • Promote general health & well being
  • Quality life

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO.:
DATE: / /

3. Secondary Prevention

- Secondary preventions is defined as action which halts the progress of a disease at its incipient stage and prevent complications.

- INTERVENTION :- "Early Diagnosis"
  Eg:- Screening tests, Case finding programs, etc.

- MEASURES :-
  - Arrest the disease process
  - Restore health by seeking out unrecognized disease & treating it before irreversible pathalogical changes takes place
  - Reverse Communicability of infectious disease

4. Teritiary Preventions

- This prevention is used when the disease process has advanced beyond its early stages.

- INTERVENTION :- "Disability limitation" & "Rehabilition"

- MEASURES :-
  - Reduce or limit impairments & disabilities
  - Promote Adjustmen to irremediable Conditions.

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* MODES OF INTERVENTION

- Interventions can be defined as any attempt to intervene or interrupt the usual sequence in the development of disease in Man.

- Interventions may be by the provision of treatment, Education, Help or Social Support.

Five method of Intervention:

1. Health promotion
2. Specific protection
3. Early diagnosis
4. Disability limitation
5. Rehabilitation.

1. Health promotion:

- the process of enabling people to increase control over and to improve health.

- In Health promotion the interventions include:
  - (i) Health education
  - (ii) Environmental modification
  - (iii) Nutritional interventions
  - (iv) life style and behavioural changes

PAGE NO.:
DATE: / /

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

2. Specific protection

- Specific protection is to avoid disease altogether, but it is possible only in a limited no. of cases.

- In specific protection interventions includes:
  (i) Immunization
  (ii) use of specific Nutrients
  (iii) chemoprophylaxis
  (iv) Protection against occupational hazards
  (v) Protection against accidents
  (vi) Protection against Carcinogens
  (vii) Avoidance of allergens
  (viii) Better environment Conditions
  (ix) Control of Consumer products.

3. Early diagnosis / Prompt treatment :

- Early diagnosis is defined as detection of disturbances of Homeostatic and Compensatory mechanism.

- In Early diagnosis interventions includes.
  (i) Early diagnosis
  (ii) screening
  (iii) Contact tracing
  (iv) Individual Exam (lab investigation)
  (v) Disability limitations

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4. Disability limitation

When a patient report late in the pathogenesis phase, the mode of intervention is disability limitation.

5. Rehabilitation

Rehabilitation is the Combined & Coordinated use of medical, Social, Educational & Vocational measures for training and retaining the individual to the highest possible level of functional ability.

In Rehabilitation, interventions include
(i) Medical rehabilitation
(ii) Vocational rehabilitation
(iii) Social rehabilitation
(iv) Emotional & Psychological rehabilitation.

* RISK FACTORS

- A Risk factor is defined as an attribute, may or maynot be modifiable, which has potential value as a predictor for the unfavourable outcome such as disease, disability or death.

- Risk factor are Commonly associated with the development of a disease, Especially non-Communicable diseases
  Eg:- Coronary artery disease
  Cancer
  Peptic ulcer, Etc

PAGE NO.:
DATE: / /

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

- Risk factors can be modified by intervention, i.e reducing the possibility of occurance of diesease, this is called Primordial prevention.

- The risk factors may characterize the environment also
  Eg:- air pollution, water Contamination
  this indicates - need for improving quality of Heath service

- The detection of risk factors will help in applying the knowledge of prevention

	Risk factors.	
1. Coronary Heart Disease	• smoking	• obesity
	• Cholestrol	• lack of physical Excercise
2. Diabetes	• obesity	• Excessive food Consumption
	• Lack of Exercise	
3. Lung Cancer	• Smoking	• air pollution
	• Asbestos dust	
4. Stroke	• High BP	• Smoking
	• Elevated Cholestrol	
5. Vehicular	• Alcohol	
	• Non-use of seat belts	
	• Excessive speed	

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* Incidence and Prevalence

INCIDENCE	PREVALENCE
• Refers to Occurance of NEW Cases only in a given area, during a given Period	• Refers to Existence of both old and new Cases in a given area, during a given period
• Incidence rate is Expressed Per 1000 population at risk	• Prevalence rate is Expressed per 100 population at risk
• Estimation requires exact Knowledge of time of onset	• Such Knowledge is not require
• Acute Cases having short Incubation period	• chronic Cases having long incubation period
• Eg:- Rabies, Measles, Etc	• Eg:- Tuberculosis, leprosy, Etc
• Types:- 1. Attack rate 2. 2° Attack rate	• Types:- 1. Point prevalance 2. Period prevalance
• Incidence rate helps to evaluate the Control measures	• Prevalance rate helps for Health planning.

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

* SUSCEPTIBLE HOST

- A person or other animal including birds, arthropods, that gives shelter or place to a infectious agent under favourable Condition. is called Susceptible Host.

- Entry may be :- Respiratory Route
  Alimentary Route
  Genital Route

- There may be even more than one route of Entry.
  Eg :- AIDS, Hepatitis - B, Etc

- Target organ :- A site where the pathogen finds optimum favourable Condition for its growth, development and multiplication and survival

- defence mechanism is at 3 levels.
  1. Anatomical protection - By Health & Intact skin
  2. chemical protection - By gastric acidity
  3. Biological protection - By Immunity.

HOST DEFENCE

- Host defence against infection are at "Local & Systemic", "Non-specific & Specific" and "Humeral & Cellular"

- Overlapping Host defence underlies the reasonable measure of good health in the face of an apparently Significant Host immune defect.

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* IMMUNIZING AGENTS

Immunizing Agents are
1. Vaccines
2. Immunoglobulin's
3. Antisera

Vaccines

Vaccines is an immuno-biological substance designed to produce specific protection against a given disease.

Types:-
1. Live vaccines
2. Inactivated or killed vaccines
3. Toxoids
4. Cellular fractions.
5. Subunit Vaccines
6. Recombinant Vaccines
7. Combinations
8. Tissue culture Vaccines.

1. Live Vaccines:

- Live vaccines are prepared from live organisms by passing repeatedly in the laboratory in tissue culture or Embryos
- Eg:- BCG, Typhoid, Measles, oral polio, rubella, Mumps, chicken pox, influenza

2. Inactivated or Killed Vaccines:

- In this, organisms are inactivated or killed by Heat or chemicals.
- Given in multiple doses in the 2 to 3 doses followed by booster dose
- Eg:- cholera, Rabies, Hepatitis-B, Encephalitis, KFD

DATE: / /
PAGE NO.:

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

3. Toxoids:

- They are modified (detoxified) toxins to maintain only antigenicity and not Pathogenicity (toxicity)
- Dose similar to Inactivated Vaccines.

Eg:- Diptheria toxoid and tetanus toxoid

4. Cellular fractions:

- Vaccines prepared from extracted cellular fractions.
- Eg:- Meningococcal Vaccine, Pneumococcal vaccine

5. Subunit Vaccine:

- This is prepared from a Component of the virus
- Eg:- Influenza Vaccine

6. Recombinat Vaccines:

- These are genetically engineered recombinant DNA Vaccines
- Eg:- Hepatitis-B Vaccine

7. Combinations

- If more than one kind of immunizing agents is included in the Vaccine, it is called mixed or Combined vaccine
- Eg:- DPT, DP, DT, MMR, Etc

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8. Tissue Culture Vaccines:

- These are prepared by culturing the seed viruses in special cells such as chick-embryo cells, vero-cells of kidney of monkey, Human Embryonic lung fibroblasts, etc

- Eg:- PCECV (Purified chick embryo-cell vaccine)
  PVRV (Purified vero-cell rabies vaccine)
  HDCV (Human diploid cell vaccine)
  } all used agint Rabies.

Immunoglobulin's (IgG, IgM, IgA, IgD, IgE)

1. Human Normal Immunoglobulin

- Normal Human Ig is an antibody rich fraction, obtained from a pool of at least 1000 donors.
- It is used to prevent measles, temporarily protection upto 12 weeks

2. Human Specific Immunoglobulin

- Specific Human Ig should Contain at least 5 times the antibody potential of standard preparation.
- Eg:- chicken pox, Rabies, tetanus.
- specific immunoglobulin's prepared from plasma of Immunized animals

Antisera or Antitoxins

- Antiserum is materials prepared in Animals like specific Immunoglobulin
- Immunity lasts for 2-3 weeks
  Eg:- ATS, ADS, ERIg, Anti snake venom & Anti gas gangrene Serum

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

* Investigation of an Epidemic

- Occurance of Epidemic Signifies -
  Shift in the existing balance between the agent host and environment.

- It requires thorough investigation of the cases to know the factors responsible and Guidance to Control measures to prevent further spread.

Objectives of Epidemic Investigation

1. To know the epidemic involvement in terms of time, place and person
2. To determine the favourable Conditions and factors responsible for the occurance of the epidemic
3. To Identify the Cause, source of infection and modes of transmission to determine measures necessary to Control the epidemic
4. To make recommendation to prevent recurrence

Steps of an epidemic investigation

1. Confirmation of the epidemic
2. Confirmation of the Existance of an Epidemic
3. Defining the population at risk

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4. Rapid search for all cases & their characteristics
5. Data Analysis
6. Formulation of Hypothesis
7. Testing of Hypothesis
8. Evaluation of Ecological factors
9. Further investigation of population at risk
10. Writing the report.

* Prevention & Control of an Epidemic

3 main preventive measure adopted for infectious disease :-

1. Controlling the Reservoir / Elimination of Reservoir
2. Interruption of transmission / Breaking the channel of transmission
3. Immunizing the Susceptible Host / Protect of Susceptible

1. Controlling the Reservoir / Elimination of Reservoir

General measure of Reservoir control comprise:

(a) Early diagnosis
(b) Notification
(c) Epidemiological investigation
(d) Isolation
(e) Treatment
(f) Quarantine

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

(a) Early diagnosis:

- Rapid identification of disease plays Crucial role in Control of Communicable disease
- Early diagnosis is needed for to treatment the patients for Epidemiological investigations.

(b) Notification

- Suspected infectious disease should be notified to the ~~Healthy~~ local Healthy authority.
- Begin Control measures, including the provision of medical care to patients

(c) Epidemiological Investigation

- The investigation helps to identy the source of infection, the factors influencing its spread in the Community

(d) Isolation

- Separation of Communicability of infected persons or animals from others for a period.
- Isolation should be done in such place & under such conditions, as to prevent the ~~dise~~ transmission of infectious agent from infected to Susceptible.

(e) Treatment

Objective of treatment is to kill the infectious agent when it is still in the reservoir before it is disseminated.

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(f) Quarantine

Restriction of movement and activities of individuals who may have been Exposed to a infectious disease, but are not yet Symptomatic, to prevent the potential Spread of the disease

2. Interruption of transmission / Breaking the channel of transmission

Changing Some Components of man's environment to prevent the infective agent from a patient or Carriers from Entering the body of Susceptible person.

3. Immunizing the Susceptible Host / Protect of Susceptible

(a) Active immunization: Strengthening of the host defences is one of the ways to Control the Spread of infection.

(b) Passive immunization: (a) Normal human immunoglobulins
(b) Specific human immunoglobulins
(c) Antisera or Anti-toxins

(c) Combined Passive & Active Immunization

(d) Chemoprophylaxis: Causal prophylaxis implies the Complete prevention of infection by the early elimination of the invading or migrating Causal agent.

(e) Non-specific Measures: Non-specific factors have a role in the decline of diseases by Improvements in the Quality of life

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

ENVIRONMENTAL HEALTH

PAGE NO.:
DATE: / /

(Air, Water, Soil, Light, Noise, Radiation, Waste disposal)

AIR

- वायु (air) is absolutely essential for the maintainance of life.
- Two main functions of air:
  - Interchanging of gases in the process of respiration
  - Regulation of Body temperature

* Properties of Air

Breeze from EAST :-
- Madhura, Lavana, Snigdha
- Hard for digestion
- Produce burning sensation during digestion
- Always aggravates रक्त & पित्त
- It is good for वात प्रकृति Persons

Breeze from SOUTH :-
- Madhura
- Easy for digestion
- Do not produce burning sensation
- Alleviates रक्त & पित्त

Breeze from WEST :-
- Dry, Rough, string
- Decreases unctuousness & Strength
- Dries up Kapha & Medas
- Reduces प्राण & Cause Emaciation

Breeze from NORTH :-
- untous, Soft, Madhura, ~~तिक्त~~, शीत
- Don't aggravate Doshas
- it Cause moistness & increase Strength
- It is beneficial for Emaciation

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Composition of Air

Normal Composition of Air by volume is approximately.

Nitrogen - 78%
Oxygen - 20%
Argon - 0.9%
CO_2 - 0.03%

* Changes of Air of the Occupied Room

CHEMICAL CHANGES

- Air becomes progressively Contaminated by CO_2 & O_2 Content decrease due to metabolic processes.

PHYSICAL CHANGES

- Rise in temperature : Indoor temp tends to rise as a result of Emanation of body heat
- Increase in Humidity : Due to moisture Evaporated from skin & lungs
- Decrease in air Movement : In occupied room natural movement of air is Blocked
- Body odours : unpleasant odours arise from foul breath, Perspiration, oral hygiene, dirty clothes & other Sources
- Bacterial Pollution : Exhaled air Contains microorganisms in which saprophytic & may include pathogenic Bacteria

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

* Comfort Zones & Indices of Thermal Comfort

COMFORT ZONES

- It is defined as the Range of Effective temperature over which the majory of adults feel Comfortable.
- Comfort depends on Physical, Physiological & Psychological factors.
- Comfortable thermal Conditions are those under which a person can maintain Normal Balance b/w production & loss of heat, at normal body temp & without Sweating

Comfort Zones		Corrected effective Temperature °C
Plesant & Cool	-	20°C
Comfortable & Cool	-	20°C - 25°C
Comfortable	-	25°C - 27°C
Hot & Uncomfortable	-	27°C - 28°C
Extremely Hot	-	28°C +
Intolerable Hot	-	30°C +

Sweat Rate Per Four Hour (P4SR)

1-3 litres	-	Comfort zone
3 - 4.5 litres	-	Just tolerable
4.5 litres +	-	Intolerable

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INDICES OF THERMAL COMFORT

It refers to a set of measurements or calculations that Quantify How Comfortable a person feel in a given Environment Based on factors like

1. Air temperature
2. Humidity
3. Cooling Power
4. Effective temperature
5. Corrected effective temperature

Effective temp deals with Temperature, Humidity & movement of internal air

Corrected Effective temp deals with Temperature, Velocity, Humidity and Mean Radiant Heat.

* AIR POLLUTION

Causes of air pollution

1. Automobiles:. Motor vehicles are a major source of air pollution
   major source of air pollution
   - They emit Hydrocarbon, CO, lead, NO_2, Etc

2. Industries :
   - They emit large amount of pollutants into the atmosphere.
   - Combustion of fuel to generate Heat & produces smoke, SO_2, nitrogen ash and fly ash

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

3. Domestic Sources: Domestic Combustion of Coal, wood or oil is main source of Smoke, dust, SO_2 & NO_2

4. Tobacco Smoke: Most direct and important source of air pollution affecting the Health of many people

5. Miscellaneous: Burning of refuse, Incinerators, Pesticide, Spraying, Natural Source (wind borne dust, fungi, molds, Bacteria) & Nuclear Energy programmes

Prevention and Control of Air pollution

1. Containment:
   - it is prevention of Escape of toxic materials into the ambient air
   - Eg:- Enclosure, Ventilation & air cleaning.

2. Replacement:
   - Replacing a technology process causing air pollution By New process
   - Increased use of Electricity in place of Coal has greatly helped in Smoke reduction

3. Dilution:
   - Self Cleaning Capacity of the Environment
   - Eg:- Establishing green belts (Field farms) Between Industrial & residential area.
     Because air pollutants are easily removed by vegetation

4. Legislation:
   - Pollution Controlled by Country by Suitable legislation
   - Eg:- Govt of India Passed "Prevention & Control of Pollution Act" in 1981

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5. International Action:

- Dealing with air pollution on a world wide scale
- WHO has established an international network of laboratories for monitoring & study of air pollution

Effects of Air pollution on Health & Social Aspects

Health aspects:

Immidiate :- Acute Bronchitis, suffocation, Death

Delayed :- chronic Bronchitis, lung Cancer, Bronchial asthma, Emphysema and Respiratory allergies.

Social aspects:

- Destruction of Plant & animal life
- Corrosion of metals
- Damage to buildings
- Cost of Cleaning & maintainance
- aesthetic nuisance

* VENTILATON

Concept of ventilation implies not only the replacement of vitiated air by a supply of fresh outdoor air, but also Control of Quality of Incoming air with regards to its temperature, Humidity and Purity with a view to provide a thermal environment that is Comfortable and free from risk of infection.

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

Types of Ventilation :- 1. Natural ventilation
2. Mechanical ventilation

Natural Ventilation

- It is the simplest system of ventilating small dwellings, schools and offices.
- In this method ventilation with Nature done naturally.

1. Wind : • Wind is an active force in ventilation
• Doors & windows facing each other opposite provide Cross Ventilation

2. Diffusion : Air passes through the smallest opening or spaces by diffusion

3. Inequality of temp: • Air flow from high density to low density.
• Heated air in room escapes from room & Cooler & High density flows inside room.

Mechanical ventilation

1. Exhaust / Vacuum ventilation : Air is Exhausted to the outside by Exhaust fans usually driven by Electricity.

2. Plenum Ventilation : Fresh air is Blown into the room by Centrifugal fans so as to Create positive pressure & displace the vitiated air

3. Balanced ventilation : • Combination of the Exhaust & plenum System of ventilation.
• Blowing fan must balance the Exhaust fan

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4. Air Conditioning : • Simultaneous control of all those factors affecting both physical & chemical conditions of atmosphere with in any confined space or room.

* Global Warming

Global warming in unusual rapid increase in earth's average surface temperature over the past century primarily due to the greenhouse gases & people's burn fossil fuels.

Effects of Global Warming

- More Heat Waves
- Expansion of desert area
- Natural fires in forest lands
- More evaporation of water from oceans & water bodies
- Melting of Ice Caps in Arctic and antarctic regions
- More cloud formation in the atmosphere
- Shorter and warmer winters coupled with longer & hotter Summers
- changes in rainfall pattern
- Rise in Sea level
- Flooding and submergence of low lying costal areas
- Disruption in farming.
- More drought
- Impact on plants, animals and humans.

PAGE NO. :
DATE : / /

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

* Effects of High Altitude and Mountain Air on Health

- It is a pathalogical effect of high altitude on humans caused by acute exposure to low partrial pressure of oxygen at high altitude
- It commonly occurs above 2,400 meter (8,000 feet)

Effects:-

- Collection of Non-specific symptoms, resembling a case of "flu", "CO poisoning" or a "Hangover"
- Acute mountain sickness can progress to "HAPE - High altitute pulmonary oedema" or "HACE - High altitude cerebral oedema"
- Chronic mountain sickness known as Monge's disease only occurs after very prolonged Exposure to high altitude

Other Common Symptoms :

- Headache
- Vomiting
- Hypertension
- Severe Breathlessness
- Ataxia
- Staggering gait (like drunk)
- Sleepiness
- unconciousness
- Pain Abdomen
- Visual disturbances
- Blood Coagulating disorders

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WATER

* Safe and Wholesome Water

"निर्गन्धमव्यक्तरसं तृष्णाघ्नं शुचि शीतलम् ।
अच्छं लघु च हृद्यं च तोयं गुणवदुच्यते ॥"

- अगन्ध (No smell)
- अव्यक्तरस (No prominent taste)
- तृष्णाघ्न (Quenches thirst)
- शुचि (Clean)
- शीतल (Cold)
- लघु (Light)
- हृद्य (Pleasing to the mind)

All these are said to be the best in Qualities or Suitable water for drinking.

Water intended for human Consumption should be both safe and wholesome, this has been defined as water that is

a. Free from pathogenic agents
b. Free from harmful chemical substances
c. Pleasant to the taste i.e free from Colour & odour
d. usable for domestic purpose

water Requirements

- Basic physiological requirements for drinking water have been estimated at about 2 litres/day. (Just for Survival)

- Standpoint of public health and improvement of the Quality of life, water should be provided in adequate volume

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

- A daily supply of 150-200 liters/Capita is considered as an adequate supply to meet the need for all urban domestic propose and 40 litres/Capita in Rural.

* Properties of Water from different Sources

1. Surface Water (Rivers, Lakes, Streams)

Physical : Clear to slightly turbid, May Contain suspended solids (i.e silt, algae or organic matter), temp Varies
Chemical : Slightly alkine, May Contain dissolved minerals
Biological : Rich in microorganisms, Risk of pathogens

2. Ground water (Wells, Boreholes, springs)

Physical : clear and odorless, Consistent temp, Cooler than Surface water
Chemical : High mineral content, May Contain Contaminants
Biological : low in microorganisms, Risk of Contamination

3. Rain water

Physical : Clear & Soft, Acidic due to dissolved CO_2
Chemical : Low in mineral Content and ions, May pick up airborne pollutants
Biological : Free of microorganisms initially but Contaminated during Collection

4. Sea Water

Physical : Salty & turbid, Brackish odor & taste
Chemical : High salinity, Contain NaCl, Mg, other dissolved salts
Biological : Contain marine microorganisms, plankton & algae

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* WATER POLLUTION

Pollution of water is of Contain impurities of various kinds Natural and man made

Impurities - Dissolved gases (i.e N_2, CO_2, H_2S, Etc)., Clay, Slit, Sand mud and microscopic organism.

Dissolved minerals - Salt of Mg, Ca, Na, Etc

Water pollution is Caused by Human activity, urbanization and Industrialization

Source of water pollution

(a) Sewage - Contain decomposable organic matter & pathogenic agents
(b) Industrial - Contain toxic agents ranging from metal salts to Complex synthetic organic chemicals
(c) Agricultural - Fertilizers & pesticides
(d) Physical - thermal & radioactive substances

Health Hazards due to water pollution

A. Biological water borne diseases -

Viral - Viral Hep-A & E, Polio, Diarrhoea in infants
Bacterial - Typhoid & Paratyphoid fever, Bacillary dysentery
Protozoal - Amoebiasis, Giardiasis
Helminthic - Roundworm, threadworm

PAGE NO.:
DATE: / /

PAGE NO.:
DATE: / /

B. Chemical - Chemical pollutants may affect man's health not only directly, but also indirectly by accumulating in aquatic life used as human food.

C. Cyanosis in infants - Because of high nitrate content of water

D. Cardiovascular diseases - Because of Hardness of water

E. Transmitted diseases - Because of inadequate use of water. of Conjunctivitis, ascariasis, scabies.

* Purification of WATER

- Purification of water is of great importance in Community medicine
- Purification of water considered under two Headings.
  1. Purification of water on a large scale
  2. Purification of water on a Small scale

Purification of water on a large scale

Components of typical water Purification - 1. Storage
2. Filtration
3. Disinfection

1. STORAGE

- Natural purification is done by Storaging Water

A. Physical :- • About 90% of the Physical impurities Settle down in 24 hrs by gravity. due to Constant Storage.
• The water becomes Clearer

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B. Chemical - Aerobic bacteria oxidized the organic matters present in the water with aid of dissolved oxygen.

C. Biological - A tremendous drop takes place in bacterial Count during storage.
i.e:- Bacteria drops down at bottom due to Constant Storage
Eg:- River Water - if stored total Bacterial Count drops ~~to~~ 90% in first 5-7 days.

2. FILTRATION

- Filtration is the 2nd stage in purification of water and Quite an Imp storage because 98-99% of Bacteria are removed by filtration, apart from other impurities.

Two types of filters used are - Slow Sand or Biological filters
- Rapid Sand or Mechanical filters

Slow Sand or Biological filters

Slow Sand filter (SSF) effectively removes turbidity and pathogenic organisms through various biological, Physical and chemical processes in a single treatment step.

Elements of Slow Sand Filter - a. Supernatant water
b. Sand bed
c. Under-drainage system
d. Filter Control valves

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

a. Supernatant Water

- It is above the Sand bed
- It Serves two Important purpose :-
  - It provides a Constant head of water to overcome the resistance of the filter bed and
  - Promote the downward flow of water through the Sand bed.
  - It provides waiting period of some period depending upon the filtration for the raw water
- The level of Supernatant water is always kept Constant.

b. Sand bed (Imp part of slow Sand filter)

- Sand grains are Carefully Chosen so that they are preferably rounded and have an effective diameter of Sand bed
- Sand should be clean and free from clay and organic matter
- Sand bed Supported by a layer of gravel which prevents the fine grains being Carried into the underdrainage pipes

c. Under-drainage System

- under-drainage pipes are under Sand bed
- It Consists of Perforated pipes which Serves dual purpose
  - Providing an outlet for filtered water
  - Supporting the filter bed above

d. Filter Control Valves

- Filter is equipped with Certain Valves and devices (i.e Venturi meter) which are incorporated in the outlet-pipe System.

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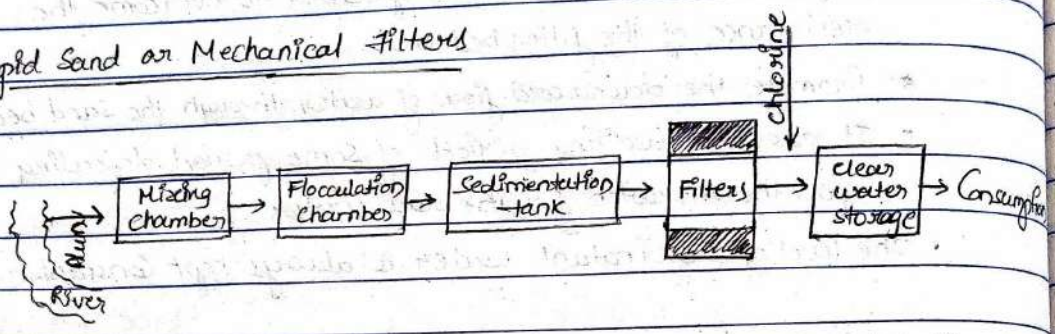
- Purpose of device (venturi meter) is to maintain a constant rate of filtration
- venturi meter - measures the "Bed resistance" or "lose of head"

Rapid Sand or Mechanical Filters



- Rapid sand filtration is purely physical drinking water purification
- Two types of RSF are typically used
  - Rapid Gravity
  - Rapid pressure sand filters.

- following steps are involved in purification of water :

a. Coagulation :

Raw water is first treated with chemical Coagulant such as alum

b. Rapid mixing:

- treated water is then subjected to violent agitation in a mixing chamber for few minutes
- this allows rapid & thorough dissemination of alum throughout the bulk of water (which is very necessary)

c. Flocculation

- It involves a slow & gentle stirring of the treated water in flocculation chamber for about 30 mins

PAGE NO. :
DATE : / /

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

- it results in formation of thick, copious, white precipitate of $Al(OH)_3$

d. Sedimentation

- the coagulated water is now led into sedimentation tank where it is detained for 2-6 hours
- 95% of flocculent precipitate needs to be removed before the water is admitted into Rapid Sand filters

e. Filteration

- water passes through the filter beds in which sand is the filtering medium
- then ~~water~~ filtered water remove freely toward the underdrainage and led to clear water outlet

Disinfection

- Disinfection is an important step in ensuring that water is safe to drink
- water systems add disinfectants to destroy micro-organisms that can cause disease in humans.
- Primitory methods of disinfection are CHLORINATION, ozone and UV - light.

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* Hardness of Water

- Hardness may be defined as the Soap destroying power of water
- Hardness of In water caused mainly by four dissolved Compounds.
  1. Calcium Bicarbonate
  2. Magnesium Bicarbonate
  3. Calcium Sulphate
  4. Magnesium Sulphate

Effects of Hard water on Health

Skin - Hard water can dry out, Irritate & make your skin feel tight

Hair - • Hard water can damage your hair by leaving behind mineral deposits that coat the hair follicle.
• this makes your hair Brittle, thin & Rough & can lead to dandruff

Kidney stones - Formation of Kidney stones is possible

SOIL

* Land Pollution

Land pollution is the degradation of earth's land surfaces often caused by human activities and & its misuse.

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

Causes of Land pollution

1. Deforestation and soil erosion
2. Agricultural activities
3. Mining activities
4. Overcrowded landfills
5. Industrialization
6. Construction activities
7. Nuclear waste
8. Sewage treatment.

Prevention and Control measures

1. Make people aware about the Concept of Reduce, Recycle, Reuse
2. Reduce the use of pesticides & fertilizers in agricultural activities
3. Avoid Buying packages items as they will lead to garbage and end up in landfill site
4. Proper disposal of garbage
5. By Biodegradable products
6. Do organic gardening and eat organic food
7. Create dumping ground away from residential areas

HOUSING

Housing is a residential environment which is defined as the Physical structure that man uses & the environs of the structure including all necessary services, facilities, Equipment and devices needed or desired for the Physical and mental Health and Social well being of the family and the individual.

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* Social Goals of Housing

1. Shelter - House should provide a sanitary shelter which is a basic need

2. Family life - House should provide adequate space for family life and related activities

3. Access to Community facilities - Accessibility to Community services and facilities such as Health service, schools, shopping areas, Places of worship, etc

4. Family Participation in Community life -
Community is imp to family in many ways
It can offer help in times of need, it is an imp source of friends.

5. Economic Stability - Housing is a form of investment of personal saving, it provides Economic stability and welbeing of the family.

Housing Standards

1. Site selection
2. Foundation
3. Set Back
4. Floor
5. Roof
6. Rooms
7. Floor area
8. Lighting
9. Windows
10. Kitchen
11. Privy
12. Garbage and refuse
13. Bathing and washing
14. Water supply.

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

* Effects of Housing on Heath

- Housing is part of the total environment of man and being a part, it is responsible for the status of man's health and well being.

- Poor Housing Causes :-

1. Respiratory infections - Common Cold, TB, Influenza, Bronchitis, etc.

2. Skin infections - Scabies, Ringworm & Leprosy.

3. Rat infestation - Plague

4. Arthropods - Houseflies, Mosquitoes, fleas & Bugs

5. Accidents - House accidents are caused by some defect in the Home and its Environment

6. Morbidity & Mortality - High morbidity & Mortality rates are observed where housing conditions are sub-standard

7. Psychological Effects - Sense of isolation felt by person living in upper floor of High Buildings is now well known to have harmful effects which may lead to Neurosis and behaviour disorder

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* Overcrowding

Overcrowding refers to the situation in which more people are living within a single dwelling than there is space for, so that movement is restricted.

It's impact on Heath

Physical Health - infectious disease like TB, influenza, diptheria spread rapidly under conditions of overcrowding.

Psychological Health - Irritability, frustration, lack of sleep, anxiety, violence, Psychological stress, leading to unhappiness and very probably to Psychosomatic and mental disorders.

LIGHT

* Good lighting, Natural lighting & Artificial lighting.

Good lighting

- Requirement of Good lighting is possible by arranging some factors that helps effectively to reading process.
- Some requirements for good lighting are:

1. Sufficient illumination - Light need to be sufficient to see objects properly, Insufficient light cause to Eye strain

DATE : / /
PAGE NO. :

PAGE NO. :
DATE : / /

2. uniform distribution :- Efficient vision without any eye stress is occur by uniformity light distribution.

3. Absence of glare : there should be Excessive light and high intensity of light cause to glare
Eg :- Automobile headlights at night, same lights during daylight would not cause glare owing to absence of high contrast

4. Absence of sharp shadows :-
Dark shawdows cause confusion to the eye and it should not be present in field of vision

5. Steadiness of Source of light :-
- Constant contrast & constant intensity of light must be present
- Flickering light cause Eyestrain & Headache

6. White colour of light :- Day light (white) is the sufficient illumination needed by eye to fulfill reading process

7. Contrast Surroundings :- Surroundings should be in a normal condition By using proper material cause to reflection

8. Angle of light :- Light source should be established in proper angle that lead to effective light by reflection

Natural lighting

- Natural lighting is derived partly from the visible sky and partly from reflection

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- Efficient utilization of natural light call for careful design, location & orientation of building

- Natural lighting depends upon the time of the day, season, weather and atmospheric pollution.

Artificial lighting

- Daylight may not meet the requirements of illumination during all hours, and especially during cloudy days.

- It should be supplemented by artificial illumination for adequate illumination

- Artificial lighting should be as close as possible to daylight in Composition

NOISE

- Noise is an unwanted sound, causing disturbance or Annoyance to the Hearer.

- Noise pollution takes place when there is either excessive amount of noise or an unpleasant sound that cause temporary disruption in the Natural balance.

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

Sources of Noise pollution

1. Industrialization :- Industries use big machines which are capable of producing large amount of Noise

2. Poor urban planning :- Congested house, large families sharing small place, In this fights leads to noise pollution

3. Social Events :- Noise is at its peak in most of social Events
Eg:- Marriages, Pubs, Temples, Etc

4. Transportation :- large no. of vehicles on Road, Aeroplanes flying over houses, underground train produce heavy noise

5. Construction Activities :- under construction activities like mining, Construction of Bridges, dams, Buildings, Roads, Etc

6. Household Chores :- TV, Mobile, Mixer, pressure Cooker, ~~fan~~, dryer, Cooler, washing machine.

Effect of Noise pollution on Health

1. Auditory Effects :-

(a) Auditory fatigue - whistling and buzzing in the ears
(b) deafness - loss of hearing may be temporary or permanent

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2. Non-Auditory effects

(a) Interference with speech - Noise interfere with speech Communication (Eg: Noise produced by Road & traffic)

(b) Annoyance - Neurotic people are more sensitive to Noise than balanced people

(c) Efficiency - Mental Concentration on work is disturbed

(d) Physiological changes - Rise in BP, Rise in intracranial pressure, increase in Heart rate & Breathing & Sweating

Control measures of Noise

1. Careful planning of Cities -
2. Control of vehicles
3. To improve acoustic insulation of Building.
4. Industries & Railways
5. Protection of Exposed persons
6. Education
7. Legislation

RADIATION

- Radiation is the process by which radiant energy is transferred from one place to another in the form of Electro-magnetic waves

PAGE NO.:
DATE: / /

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

- Higher the freqeuency of a radiation, higher will be its energy.
- Higher the Energy of Radiation, Higher damage to the living organisms.

Source of Radiation

Natural	Man-made
1. Cosmic rays	1. Medical & dental x-Rays, Radioisotopes
2. Environmental	2. Occupational Exposure
3. Internal (Potassium & Carbon)	3. Nuclear - Radioactive fall out
	4 - Miscellaneous - Television sets, watches, Isotope tagged products

Effects on Health

1. Somatic effects - • whole body was found to affect the white blood corpuscles and to produce mild lassitude and softening of muscles
• delayed effects cause - Leukemia, malignant tumors & shortening of life

2. Genetic effects - Genetic effects would be manifest in offspring.
Eg: Injury to Chromosome
(Chromosome mutations & point mutations)
↓ affects sterility ↓ affects genes

Cont Preventive Control measures

1. Leakage of radioactive materials from nuclear reactor, industries & laboratories should be totally stopped

2. Radioactive wastes disposal must be safe
(wastes with very low radiation be discharged in Sewage)

3. Preventive measures should be taken
i.e Natural radiation level doesn't rise above the limits

4. Appropriate steps should be taken against occupational Exposure.

5. Safety measures should be taken against accidents in nuclear power plants.

WASTE DISPOSAL

Solid Waste

the term Solid waste includes garbage (food waste), Rubbish (Paper, plastics, wood, metal, glasses), demolition products (Bricks, masonry, pipes) sewage treatment residue, dead animals, manure and other discarded materials.

Types of Waste :-

1. Dry refuse (or) Solid waste
2. Wet refuse (or) liquid waste
3. Excreta

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

1. Dry refuse or solid waste

- This includes all unwanted (or) discarded waste material arising from houses & streets and from Commercial, Industrial and Agricultural activities of man.

- It includes public & domestic refuse.
  - Garbage, kitchen waste, leftover food
  - Rubbish, water paper, Broken glass, Bottles & tins
  - Ashes from burning wood, charcoal & Cow dung
  - Animal dung, Dead animals
  - Stree sweepings, Fallen leaves

2. Wet refuse or Liquid waste

- Waste from houses - After Bathing, washing clothes, utensils, etc
- Waste from Public wells & washing places
- Waste from Cattle sheds & market places
- Waste from Cotton industries such as dyeing and weaving.

Storage & Collection

Storage :-

- A steel dustbin with closed fitting Cover is suitable receptacle for storing refuse.

- Capacity of bin depends upon the no. of users and frequency of Collection

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- Paper Sacks - Store refuse in the paper sack and the sack is removed with the contents for disposal & the new sack is substituted.
- Public bins - It's a concrete platform raised 2-3 inches above the ground level to prevent flood water entering the bins.

Collection

- House to House collection is the best method of collection the refuse.
- People expect to dump the refuse in the nearest public bin in places where house to house collection is not available. Hence, it shouldn't be done.

* Methods of Disposal

1. Dumping
2. Sanitary land field
3. Incineration
4. Composting
5. Manure pits
6. Burial

1. Dumping

- Refuse is dumped in low lying areas partly as a method of reclamation of land
- It is easy method of disposal of dry refuse
- Here Bacterial action refuse decreases in volume and converting into humus.

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

- It is not widely used because of
  - Refuse is Exposed to flies & Rodents
  - smell and unsightly appearance
  - refuse is dispersed by the action of wind

2. Sanitary land field

- Sanitary land field is most satisfactory method of refuse disposal where suitable land is available
- There are three methods are used
  - trench method
  - Ramp method
  - Area method

} Exposed surface is sealed with mud after dumping.

trench method - A long trech is dug out depending on local Conditions where Compacted refuse is placed in a field

Ramp method - Moderate sloping is done for disposal of refuse

Area method - • Land depressions are made where refuse is deposited, packed and Consolidate in uniform layers
• Each layer is sealed on its Exposed surface with mud

- chemical, Bacteriological and Physical changes occur in buried refuse
- The temp rises to over 60°C within 7 days & kills pathogens and hastens the decomposition process.
- It takes 4 to 6 months for complete decomposition of organic matter into an innocuous mass.

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3. Incineration

- Refuse can de disposed hygienically by burning as incineration.
- It is method of choice where suitable land is not available
- Hospital refuse is particularly dangerous & its best of incineration.

4. Composting

- It is method of Combine disposal of refuse and night soil
- Here ~~Process of Release is~~ ~~Break down~~ organic matter breaks down under bacterial action resulting in the formation of Compost (which has a Considerable manurial value for soil).
- A trench is dig depending upon the amount of refuse and night soil to be dispose
- First layer of refuse is spread on the bottom of the trench, over this nigh soil is added as a layer
- Alternate layers of refuse & night soil are added till the heap rises above ground level
- within 7 days, as a result of Bacterial action heat is generated on the Compost
- At the end of 4 to 6 months, decomposition is complete & manure is well decomposed & that land field is ready to use

5. Manure pits

- Garbage, Cattle dung, straw & leaves should be dumped into manure pits & Cover with Earth after each days dumping.
- In 5 to 6 months time, the refuse is Converted into manure which can be returned to field.

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

6. Burial

- This method is suitable for small camps
- A trench is excavated, and at the end of each day the refuse is covered with earth.
- the trench is filled with earth & compacted & new trench is dug out
- the contents may be taken out after 4 to 6 months and used on the fields.

* Bio-Medical Waste management

- Bio-medical waste is highly potential for infection and injury than any other type of waste.
- It is Essential to have safe and reliable method for its handling.
- Biomedical waste means any waste, which is generated during the diagnosis, treatment, or immunization of human beings or animals or in research activities pertaining in the production or testing of Biological & including other wastes

Waste Category	Treatment and disposal
1. Human Anatomic waste (Human tissue, organ, body parts).	Incineration Burial
2. Animal waste (Animal tissue, organs Body parts)	Incineration Burial

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3. Microbiology & Biotechnology waste (laboratory cultures, specimens, vaccines)	Incineration
4. Waste sharps (needles, syringes, scalpels blades, etc)	Disinfection
5. Discarded medicines & Cytotoxic drugs (outdated contaminated & discarded mdicines)	Incineration / Secure landfills
6. Solid waste (items contaminated with blood, fluids, dressing plaster, etc)	Incineration / autoclaving
7. Liquid waste (waste generated from laboratory & washing, cleaning, etc)	Disinfection by chemical treatment
8. Incineration ash (ash from incineration) of any biomedical waste	Disposal in municipal landfill

Bio-medical waste management Rules, 2016

1. Phase out the use of chlorinated plastic bags, gloves, & blood bags within 2 years
2. Pre-treatment of the laboratory waste, microbiological waste, Blood samples and blood bags through disinfection
3. Provide training to all its health care workers and immunise all health workers regularly.

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

4. Establish a Bar-code system for bags or Containers Containing bio-medical waste for disposal

5. Bio-medical waste has been classified into 4 Catogories instead 10 Categories, to improve the segregation of waste

6. Procedure to get authorisation simplified for bedded hospitals.

7. Incinerator to reduce the emission of pollutants in Environment.

8. Inclusion of emissions limits for Dioxin & furans

9. State govt to provide land for setting up Common bio-medical waste treatment & disposal facility.

10. operator of a Common bio-medical waste treatment and disposal facility to ensure the timely Collection of Bio-medical waste from the HCF's (Health Care facility)

* Excreta Disposal Method

- There are no. of excreta disposal.
- Some are applicable to unsewered areas.
- Some are applicable to sewered areas.

I. Unsewered areas

1. Service type latrines
2. Non-service type latrines (Sanitary latrines)
3. Latrines suitable for Camps and temporary use

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II. Sewered areas

1. Primary treatment
   - Screening
   - Removal of grit
   - Palin sedimentation

2. Secondary treatment
   - Trickling filters
   - Activated sludge process
   -

3. Other methods
   - Sea outfall
   - River outfall
   - Sewage farming.
   - oxidation pond

Sanitary latrines (Non-service type latrines)

a. Bore hole latrine
b. Dug well or pit latrine
c. Water seal type of latrine
d. Septic tank
e. ~~Bore hole~~ Aqua privy.

a. ~~Bore hole~~ Sanitary latrine is one which fulfills the following criteria.
   - Excreta should not contaminate the ground or surface waters
   - Excreta should not pollute the soil
   - Excreta should not be accessible to flies, rodents, animals, etc

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

Squatting Plate

Pan trap

PAGE NO. :
DATE : / /

- Excreta should be not creating a nuisance due to odour or unsightly appearance.

a. Bore hole latrines

- Bore hole latrines have an hole instead of dug pit and may be sunk
- dug may be done quickly by hand or machine in areas where the soil is firm, stable & free from rocks or large stones.

b. Dug well or pit latrine

- It is improvement over the bore hole latrine
- A circular pit is dug into the ground for the reception of the night soil.
- Pit may be line with pottery rings as necessary to prevent caving in the soil
- A Concrete squatting plate is placed on top of the pit & latrine is Enclosed with a superstructure

c. Water seal type of latrine
(RCA latrine)

- It is Hand flushed "water seal" type of latrine.
- The squatting place is fitted with water seal

water seal performs 2 imp functions :-

- It prevent access by flies, night soil is sealed off from flies, By a small depth of water contained in bent pipe called trap.
- It prevent Escape of odour & foul gases and thereby Eliminates the nuisance from smell.

- once the latrine flushed, night soil is no longer needed

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d. Septic tank

- It is water-tight masonary tank into which household sewage is admitted for treatment
- It is satisfactory means of disposing excreta and liquid waste from individual dwelling, small group of houses & institutions which have adequate water supplies

e. Aqua privy

- The aqua privy function like a septic tank and has been used in different regions in the Country.
- A privy consists of water tight chamber filled with water
- A short length of a drop pipe from latrine floor dips into water
- Night soil undergoes purification by anaerobic digestion
- Since there is evolution of gases & gases should escape from 'vent' open above roof of dwellings.

* Modern Sewage treatment

- It is based on biological principles of sewage purification, where the purification is brought about by the action of Anaerobic and Aerobic bacteria.

- Treatment of Sewage may divide into Stages
  1. Primary treatment
  2. Secondary treatment

PAGE NO.:
DATE: / /

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

1. Primary treatment
(the solids are separated from sewage to anaerobic digestion)

a. Screening

- Sewage arriving at a disposal work is first passed through a metal screen which intercepts large floating objects such as pieces of wood, rags, masses of garbage & dead animals.
- Their removal is necessary to prevent clogging of the treatment plant

b. Grit chamber

- Sewage is then passed through a long narrow chamber called the grit chamber
- The function of grit chamber is to allow the settlement of Heavier solids such as sand and gravel.
- The grit which collects at the bottom of the chamber is removed periodically & disposed off by dumping or trenching.

c. Primary Sedimentation

- Sewage is now admitted to huge tank called Primary sedimentation tank.
- Sewage spends about 7-8 hours in tank
- Nearly 50-70% of solids settle down & it is called sludge (i.e organic matter)

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- The sludge is removed by mechanically operated devices, without disturbing the operation in tank.

- while, small amount of biological action takes place in which micro-organisms present in sewage attack complex organic solids & Break them down into simpler substance & Ammonia

- Certain amount of grease rise to the surface to form scum which removed time to time & disposed off.

2. Secondary treatment

(Effluent is subjected to aerobic oxidation)

- Effluent from the primary sedimentation tank still contains a proportion of organic matter & numerus living organisms.
- It has high demand for oxygen & cause pollution of soil or water

(a) Trickling filter method

- Effluent from primary sedimentation tank is sprinkled uniformly on the surface of the bed by revolving device (consists of hollow pipes)

- Pipes keep rotating, Sprinkling the effluent in thin film on the surface of the filter.

- over surface of filter a Biological growth (fungi & algae) occurs as zoogleal layer

PAGE NO.:
DATE: / /

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

- Zoogleal layer gets oxidized by bacteria flora, it grows & dies
- dead matter breaks away & is washed down the filter, it is light green flocculent material called humus
- Oxidized sewage is now led into the secondary sedimentation tank or humus tanks.

(b) Secondary sedimentation

- Oxidized sewage from trickling filter or aeration chamber is led into sedimentation tank where it is held for 2-3 hours
- Sludge that is collected from secondary sledge is called aerated sludge
- Activated sludge is pumped into the sludge digestion tanks for treatment & disposal

Sludge digestion

activated sludge undergoes anaerobic auto-digestion in which solids are broken down into water, CO_2, NH_4, etc

Disposal of Effluent

- The effluent is diluted in the body of water and the impurities are oxidized by the dissolved oxygen in water
- Since people use river water for drinking purpose, the effluent must be rendered free from pathogenic organisms by adequate chlorination.

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* Understanding the Environment Protection Act, 1986

- Environment protection Act (1986). is an umbrella Act, that the Central Govt the right to oversee environmental protection in India.
- The govt can issue rules & regulations from time to time to discharge its functions.
- "Environment" includes water, air, land and & the inter-relationship which exists among and between water, air, land and human beings, other living creatures, plants, microorganisms, and property.

The Central govt is Empowered to:

1. Plan & Execute a nation-wide programme for prevention & Control of Environmental pollution
2. Lay down standards for the Quality of Environment in its various aspects
3. Lay down standards for discharge of Environmental pollutants from various sources
4. Restriction of areas in which any industries/ operations shall/shall not be Carried out subject to certain safegaurds
5. Central govt may appoint Govt officers under this Act
6. Restriction on pollution Discharge

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

DISASTER MANAGEMENT

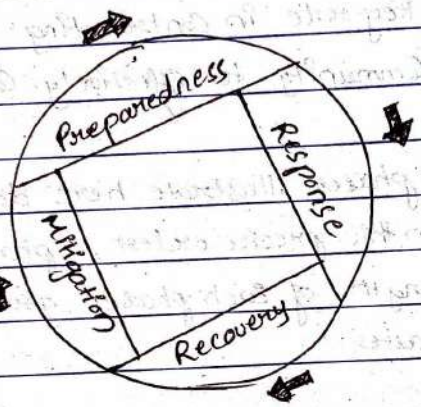
PAGE NO. :
DATE : / /

* Disaster & Disaster management

Disaster :-

A disaster can be defined as "any occurrance that causes damage, ecological disruption, loss of human life or deterioration of health & health services on a scale sufficient to warrant an Extraordinary response from outside the affected Community or Area"

Disaster management



- Mitigation :- Minimizing the effects of disaster
  Eg:- Building codes & zoning
  Vulnerability Analyses
  Public Education

Preparedness :- Planning How to respond
Eg:- Preparedness plans
Emergency Exercise/Training
Warning Systems

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Response :- Efforts to minimize the hazards created by disaster
Eg:- Search & Rescue
Emergency relief

Recovery :- Returning the Community to Normal
Eg:- Temporary housing
Medical Care

- Mitigation and preparedness phases occur as disaster management improvements are made in Anticipation of a disaster event

- Recovery Phase play a key role in contributing to mitigation and preparation of a Community to Effectively Confront a disease.

- 4 Disaster management phases illustrate here do not always occur in isolation or in this precise order, phases of Cycle overlap and the length of each phase greatly depends on the Severity of disaster

* Effects of Natural & Man-made disasters

Natural disasters

A. Natural Disaster's beneath Earth's Surface :-

1. Earthquake :- • It is due to interactions at the edge of great Plates of the Earth

2. Tsunamis :- • These are due to Earthquakes under the sea
• Resulting in floods on the Coastal lands

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

3. Volcanic eruptions :- • mud slides and glowing slides
• There will be injuries, burns & suffocation

B. Natural disaster's at Earth's Surface

1. Land slides - Land slides occurs in mountain are, where the land slopes are sufficiently steep.

2. Avalanches - Snow fall at moantain region

C. Natural disaster's above earth's Surface

a. Meteriological disaster's

1. Windstorms - • Severe wind occur in a Circular band
• It Cause danger to the life

2. Tornadoes - • A tornado is like a Cyclone, a vortex of air
• Big objects may be vacuumed from the ground.

3. Hailstorms (Snow storms) - • It is a solid rain made up of balls or lumps of ice
• damage buildings & crops, & Cause injuries

4. Sea-Surges - Sudden rise of water hitting areas close to the Coast

5. Floods - • overflow of River, heavy rainfall, melting of dams, Et
• Cause greater deaths

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6. Droughts - Prolonged period of Abnormally low rainfall leading to shortage of water

b. Biological ~~the~~ Disasters
1. Epidemics of disease
2. Locust Swarms.

Man-Made disaster

- It is a disaster resulting from human intent, negligance or error
- It results in huge loss of life & property.
- It further affects a person's mental, physical & social well being.

a. Caused by warfare

1. Conventional
2. Nuclear
3. Biological
4. Chemical

b. Caused by accidents

1. Vehicular - Air Crafts, trains, ship, 4 & 2 wheeler
2. Drowning
3. Collapse of Building
4. Explosions
5. Fires
6. Biological
7. Chemicals including poisoning

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

* Epidemic Surveillance and Disease Control

Disaster can increase the transmission of communicable diseases through following mechanisms.

1. Overcrowding and Poor Sanitations in temporary Settlements.

2. Population displacement may lead to Introduction of communicable diseases.

3. Disruption & Contamination of water supply, Damage to sewerage system & power system.

4. Disruption of routine control programmes

5. Ecological changes may favour breeding of vectors.

6. Displacement of domestic and wild animals

Disease Control

- Vaccination - Mass vaccination programmes
- Nutrition - Nutrition should be given mainly to Infants, children, Pregnant women, nursing mother & Sick persons.
- Rehabilitations - water supply, food safety, Basic Sanitation and personal hygiene, vector control comes in rehabilitation.

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- Disaster mitigation in Health Sector-
  Flood mitigation works, appropriate land use planning, improving building codes, protection of population.

- Disaster preparedness
  appropriate systems, procedures & resources are in place to provide prompt effective assistance to disaster victims.

PAGE NO.:
DATE: / /

Scanned with ACE Scanner

OCCUPATIONAL HEALTH

PAGE NO. :
DATE : / /

* Occupational Health And Ergonomics

Occupational Heath

- It is the branch of medicine dealing with the prevention and treatment of Job related Injuries and illness.

- Occupational health Embrace all types of Employment including.
  - Mercantile & Commercial Enterprizes
  - Forestry and Agriculture
  - Industrial Hygine
  - Industrial diseases
  - Industrial accidents
  - Industrial rehabilitation
  - Toxicology in relation to industrial Hazards
  - Occupationd Psychology.

- Occupational Health in Agriculture and Ergonomics is Concerned with Human Engineering.

Ergonomics

- It is the study of people's efficiency in their working Environment

- Ergonomics means "Fitting the Job to the worker" that means placing the worker in an Job, which is Adopted to his Physiological & Psychological Capacity.

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- Ergonomics Achieve " Best mutual Adjustment between man and machine, which are Complimentary to Each other"

- Health of the Worker is influenced by 3 factors
  - Occupational Environment
  - Domestic Environment
  - Social Security & welfare measures

Aims:
1. To increase the Efficiency
2. To increase the production
3. To decrease the accidents.

Objectives:
1. To promote the Health of the workers
2. To maintain the Highest degree of physical, mental and Social well being of the workers
3. To prevent the disease by elimination of factors which are Harm to their Health.

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO.:
DATE: / /

* Occupational Hazards

An Industrial worker is Exposed to the following Hazards

1. Physical
2. chemical
3. Biological
4. Mechanical
5. Psychological

Physical Hazards

- Heat : Heat Syncope , Heat Hyperpyrexia , Heat Stroke
  Heat Cramps , Heat Exhaustion ,
- Cold : Frost Bite , Chilblains
  Erythrocyanosis , Gangrene
- Heat Syncope : Fainting attack due to Pooling of Blood
- Heat Cramps : Painful & Spasmodic Contraction of muscles
- Heat Hyperpyrexia : Failure in Heat regulation mechanism
- Heat Exhaustion : loss of salt leading to Circulatory failure
- Heat Stroke : Failure in Heat regulating mechanism
- Frost Bite : Erythema & Slight pain
- Erythrocyanosis : Limbs are Swollen and red
- Chilblains : Itching and Burning.

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- Inadequate light - Headache, Eye strain, Eye fatigue
- Excessive light - Blurring of vision, discomfort & accidents
- Noise - Deafness, tinnitus, irritability, Nervousness
- Vibration - Generally affects Hands & Arms

Chemical Hazards

(Local, Inhalation & Ingestion)

1. Local effects : Dermatitis, ulcer & even Cancer
2. Inhalation : Dusts, fumes, gases
   - Dust ; Industry mines, Pottery, wood or stone working Industries
     Eg:- Pneumoconiosis
   - Fumes : Metal fume fever
   - Gases : Exposure to gases like CO, SO_2, Cl_2, Chloroform, etc
3. Ingestion : lead, arsenic, mercury, etc

Biological Hazards

- Exposing to infective and parasitic agents at the place of work
- these are from animals & soil

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

1. Animals - Zoonotic disease (Eg: Rabies, Plague)
2. Soil - Tetanus, gangrene, oedema

Mechanical Hazards

10% of accidents in the industry are due to mechanical causes

Psychological Hazards

1. Psychological & Behavioural changes :
   Aggressiveness, anxiety, depression, frustration, etc
2. Psychosomatic ill Health :
   Neurosis, fatigue, peptic ulcer, hypertension, etc

* Occupational Diseases and their Prevention & Control

1. Pneumoconiosis
2. Silicosis
3. Occupational Dermatitis
4. Anthracosis
6. Byssinosis
6. Bagassosis
7. Asbestosis
8. Farmer's Lung
9. Lead Poisoning
10. Occupational Cancer

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1. Pneumoconiosis

- Variable period of exposure to dust cause Pneumoconiosis
- In Pneumoconiosis, may gradually cripple a man by reducing his working capacity due to lung fibrosis

2. Silicosis

- It is type of Pneumoconiosis
- It is caused by inhalation of crystalline dust
- Inflammation & scarling (nodular lesions) in the upper lobes of lung

Prevention & Control:
- Dust is controlled by dry air filtering
- Water spray is used where dust emanates.

3. Occupational Dermatitis

- Skin condition that occurs when someone comes into contact with certain substances (ie; physical, chemical and biological agents) in the workplace.
- It causes redness, itching, swelling, blistering, flaking and cracking.

Prevention & Control :-
- Protective clothing, long leather gloves, aprons and boots
- Protective clothing should be frequently washed and kept in good order.

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

4. Anthracosis (Coal workers Pneumoconiosis)

- Black lung disease, Caused by long Exposure to Coal dust
- It is characterized by accumulation of Carbon in lungs.
- It Causes chest pain, Bronchitis, lung stiffening, Shortness of Breath, Impaired lung functions.

5. Byssinosis

- It is Caused by Breathing in the dust produced by Raw Cotton, dust from vegetable fibres. Such as flax, Hemp or Jute white at work.
- Symptoms: chest tightness, Chronic Cough, Dyspnoea, Wheezing, Tachypnea

Prevention & Control

- Reduction of dust levels by improving machinery.
- Stop smoking if you are a textile industry worker.

6. Bagassosis

- It is Caused by inhalation of Bagasse or Sugarcane dust
- Symptoms :- Breathlessness, Cough & Slight fever

Prevention & Control

Bagasse Control - By keeping the moisture Content above 20% and Spraying the Bagasse with widely used fungicide.

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7. Asbestosis

- It is chronic inflammatory & affecting the Parenchymal tissue of lung caused by the inhalation & Retention of Asbestos fibres.
- Symptoms:- Nail Abnormalities & clubbing of fingers, chest pain, cough & Crackles present.

Prevention & Control
- Early Screening by chest X-ray
- Frequent rest periods
- usage of sophisticated machines.

8. Farmer's Lung

- It is due to inhalation of mouldy Hay or grain dust in the agricultural field.
- Symptoms:- Acute illness & Pulmonary fibrosis (due to repeated Exposure)

9. Lead Poisoning

- Industrial workers exposed to lead in Industries through Inhalation (or) Ingestion (or) through skin
- Symptoms:- Abdominal Colic, Constipation, loss of appetite, Anaemia, wrist drop, foot drop

Prevention & Control
- lead Compounds should be Substituted by less toxic materials.
- lead dust & fumes should be Enclosed & Segregated

DATE: / /
PAGE NO.:

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

- Workers should be protected by approved respirators
- Periodic Examination of workers
- Personal hygiene

10. Occupational Cancer

- Cancer can occur in the sites of body most commonly affected are skin, lungs, bladder & blood forming organs.

Prevention & Control of Occupational Diseases

A. Engineering level

- Good House keeping
- General ventilation or Exhaust ventilation
- Protective devices like Mask, shields, aprons, Etc
- Dust Control by water spraying
- Enclosure by shielding with protective Coverage.
- Design of Buiding.

B. Medical level

- Periodical check-ups or Examination
- Medical & Health Care facilities.
- Health Education & Counselling.
- Early diagnosis
- Notification and record maintainance.

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* ESI Act, 1948 And Factories Act, 1948

Employees State Insurance Act 1948

- This Act is an important measure of Social Security and Health Insurance in India
- This Act provides Benefits in Cash & Kind, to the Industrial Worker in Case of Sickness, maternity and Empolyement Injury. thereby Removing Economic fear & Physical fear.

Scope :- It applies to all the factories Emplaying less than 20 members and power is used

Benefits to Employees :-
- Sickness Benefit
- Maternity Benefit
- Disablement Benefit
- Dependant Benefit
- Funeral Benefit
- Medical Benefit
- Rehabilitation Benefit

"All these Benefits are for those ~~Employees who wages don't Exceed 7500/month~~"

Common Services

1. Facilities like OPD Services, drug Supply, Immunization, Etc
2. Sickness benefit in the form of Cash for 91 days
3. Maternity benefit in the form of Cash in Case of Pregnancy
4. In Case of Injury or disability - payment is given periodically
5. In Case of death funeral Expenses are borne by the agency
6. On Payment of 10/month the member & family get free treatment Even after retirement or disability

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

Factories Act 1948

Scope :- It applies to the employees where
- 10 or more workers are working in a place where power is used is called as Factory.

Health, Safety and Welfare

- Here cleanliness, lighting, ventilation are considered
- Safety officer is appointed for every 1000 or more workers are working.
- Canteen should be present where 250 workers are working.

Age :- • children below 14 years are Prohibited
• Adolescents 15 - 18 years can work after Surgeon-Certifies

Working Hours :- 48 hrs/week or 9 hrs/day.
Rest of 1/2 Hour after 5hrs work

Leave with wages :- 1 day for 20/30 days of work

- Occupational disease should be notified.
- Employment Hazard should be Considered.

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SCHOOL HEALTH SERVICE

* Health problems of School children

1. Nutritional problems :-
   - Malnutrition - Includes undernutrition & micronutrient deficiences
   - obesity - due to Poor dietary habits & Sedentary lifestyles.

2. Infectious diseases
   - Respiratory infections : Common Cold, airborne disease
   - G-I infections : Food borne disease
   - skin diseases : Fungal infections like ring worm.

3. Poor Hygine & Sanitation
   - Dental problem : Dental Caries, Gingivitis, Etc
   - Water borne : typhoid & Hep-A

4. Mental Health problems
   - Emotional stress : Due to Academic pressure & Competition
   - Behavioral disorders : Hyperactivity, aggression

5. Substance Abuse
   - Experimentation with tobaco, Alcohol & other substance often starts during Adolescence

6. Physical problems
   - Vision problem : Myopia due to Prolonged screen time & lighting Conditions
   - Hearing issues : Congenital defect
   - Postural defect :- Scoliosis or kyphosis due to improper seating

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO.:
DATE: / /

7. Accidents & Injuries
- Road traffic accidents & Sports injuries

8. Lifestyle disorders
- sedentary habits leading to physical Inactivity.
- Sleep disorders due to late night studies & Excessive use of electronic devices.

9. Immunization deficiencies
- Incomplete immunization increases the risk of Vaccine preventable diseases (Eg:- measles, mumps & rubella)

10. Social & Environmental factors

- Bullying : Impact mental Health
- child Abuse : Physical, Emotional or Sexual Abuse can have long term effects.
- Poverty : Access to proper healthcare & nutrition

* Aspects of School Health Services

These are designed to provide Comprehensive Health Care such as Preventive, promotive & Curative Services.

1. Health :

Periodic medical Examinations are conducted once a year, starting from admission, and it is results are recorded in the School Health record.

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2. Immunization :-

School children should recieve routine immunizations, including Hep-B, Typhoid, tetanus & Rubella Vaccines

3. First-aid & Emergency Care :-

Teachers provide emergency care for children Injured or sick in schod premises, such as injuries, fractures unconciousness, fits, vomiting and diarrhoea, Etc

4. Screening Procedures

Evaluation of mental Health, dental Health, and vision and hearing defects is crucial for learning.

5. Referral Services

children with visual, dental, hearing defects are referred to appropriate health agencies for better treatment and special clinics in rural areas.

6. Follow up :

Ensure child adheres to referral service

7. Examination of teachers & other staff

Staff Examined for diseases to prevent children's infection

8. Maintaining Records :-

Student Cumulative record contains information on health status, services provided and past & present Health Status.

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

* Duties of School medical officers

. The principal objective of the school medical officers is early detection and treatment of defects in children.

. Duties of school medical officers are:-

1. To organize preventive measures
2. To arrange for periodic immunization of children
3. To isolate & quarantine of the children suffering from contagious disease
4. To guide about the site of school building, its ventilation, lighting, Hygienic cleanliness and sanitary upkeep.
5. To guide teachers about principles of Healthful living of children, Importance of Hygiene cleanliness and first-aid training.
6. Medical checkup of School children and upkeep of their medical records
   Eg: Height, weight, Nutrition diet, Vision, Hearing, Immunization, etc.

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* Maintainance of Healthy Environment in the School

- There are clear strategies to apply to assit in creating and maintaining a Healthy Atmosphere.

- The surroundings of a school are very important because it affects the students and their progress to great Extent. By keeping a healthy environment is
- Necessary for schools to accelerate the growth of children.

- Healthy school Environment include access to Healthcare, Healthy food and physical activity, clean air and water and Education about making healthy choices.

- School should offer them

  - Healthy food :- wholesome meals
  - Physical activity :- PE classes & Playtime

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

DISINFECTION

PAGE NO. :
DATE : / /

* Definition of different term used in relation to disinfection

Disinfection - the process of elimination of most pathogenic microorganisms on inanimate objects

Some of the most common terms used in relation to disinfection

- Antiseptic :- A substance that inhibits the growth of microorganisms on living tissue
- Disinfectant :- A chemical agent used to kill microorganisms.
- Sterilant :- A chemical agent that kills all microorganisms including spores, on inanimate objects.
- Sanitizer :- A chemical agent that reduces the no. of microorganisms on surface to a safe level
- Germicide :- A general term for any agent that kills microorganisms.
  - Germicides can be disinfectants, Antiseptics or steriliz
- Bactericide : An agent that kills fungi
- Fungicide :- An agent that kill fungi
- Viricide :- An agent that kills viruses
- Sporicide :- An agent that kills spores

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* Types of Disinfection

1. Concurrent disinfection
2. Terminal disinfection
3. Pre Current disinfection

Concurrent disinfection

It is the application of disincentive measures as soon as possible after the discharge of Infectious material from the body of an infected person.

Terminal disinfection

It is the application of disincentive measures after the patient has been

- Ceased to source of infection
- Rush to a Hospital
- discontinued from hospital isolation practice
- Removed from hospital by DEATH.

Pre-Current disinfection

Disinfection of water by chlorine, pasteurisation of milk and Hand washing are Examples of pre current disinfection.

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

* Natural Agents, Physical Agents & chemical Agents

Natural Agents

1. Sunlight : The sunlight is more effective in killing germs due to combination of ultraviolet rays & Heat

2. Heat : The articles that cannot withstand high temperatures can still be sterilized at lower temperature by prolonging the duration of exposure

3. Air : Exposure to open air acts by drying or evaporation of moisture which is lethal to most bacteria.

Physical Agents

1. Burning : Inexpensive articles such as contaminated dressings, rags and swabs can be disposed off by burning.

2. Hot air : Hot air is very useful for sterilizing articles such as glassware, syringes, swabs, dressings, oils, vaseline and sharp instruments.

3. Boiling :- • Boiling is effective method of disinfection
• Boiling for 5-10 mins will kill Bacteria, but not viruses

4. Autoclaving :- • Sterilizers which operate at high temp and high pressure called autoclaves
• It destroys all forms of life, including spores.

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5. Radiation :- Ionizing radiations is being increasingly used for sterilization of Bandages, dressing and Surgical instruments

Chemical Agents

Chemical agents may ~~also~~ be used for disinfection of faeces, urine and other contaminated material.

1. Phenol and related Compounds

- Phenol
- Crude phenol
- Cresol
- Cresol Emulsions
- Chlorhexidine
- Hexachlorophane
- Dettol

2. Quaternary ammonia Compounds

- Centrimide
- Savlon

3. Halogens and their Compounds.

- Chlorine & Cl Compounds
- Bleaching powder
- Sodium Hypochlorite
- Halazone tablets
- Iodine
- Iodophors

4. Alcohols
5. Formaldehyde
6. Miscellaneous :- Lime & Ethylene oxide

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

* Disinfection Procedures of Faeces & urine, Sputum and Room

Disinfection procedure of Faeces & urine (Excreta)

Excreta should be collected in impervious vessels and disinfected by adding equal quantity of following disinfectants

1. 8%. Bleaching powder solution
2. 10%. of Crude phenol
3. 5%. Cresol
4. 10%. Formalin

if any of these disinfectants are not available then,
- Add equal amount of milk of lime, or
- Add a bucket of boiling water

Disinfection procedure for Sputum (Esspecially TB patients)

It is spread / Recieved in the gauze or paper handkerchiefs and is destroyed by burning or it is buried in the earth far from human habitation.

Disinfection procedure for Room (operation theatre / Isolation ward)

- The isolation ward need to be disinfected after discharge or death of the Patient following:

  - doors & windows are kept open for several hours for good aeriation.

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- Room is disinfected usually by mopping, spraying and fumigation

* Ayurveda disinfection methods

Ayurvedic disinfection methods of air

- Sterilisation of air by Agnihotra
- Sterilization of House & placed around it by धूपन (fumigation) with medicated drugs like हरिद्रा, अतिविष, हरितकी, etc

Ayurvedic disinfection methods of water

- हंसोदक is the Natural purification of water by Rays of Sun and moon along with अगस्त्य नक्षत्र during शरद ऋतु
- Highly polluted water shold be disinfected through Boiling
- Moderately polluted wates should be disinfected By quenching Red Hot iron ball or Sand
- Less polluted wates should be disinfected ~~through~~ By Exposure to Sun light

Ayurveda disinfection method of Land

- Traditional disinfection of land is performed by clearing, Burning, grazing of cows, sprinkling of water (disinfectants), Scraping and covering land
- House can be purified by wiping, washing & white washing.

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO.:
DATE: / /

Ayurvedic disinfection methods of Room

Room for parturient lady, Pediatric ward, Inpatient ward should be free from direct light, fierce wind, contaminated air, dust, smoke. & with proper ventilation

Ayurveda disinfection methods of सूतिकागार (Room for Parturient lady)

Plants of निम्ब, तुलसि, वनतुलसि should be present in & around house for prevention & protection of disease & against unwanted Harmful animals and insects.

Ayurveda disinfection methods of कुमारागार

- Protection with various compound formulations, Comprising of Natural biocides & fumigants
- Fumigation of the garments, bed & furnishings.

PRIMARY HEALTH CARE

* Definition of Primary Health Care

- It is essential Care made universally accessible to individuals and acceptable to them through their full participation & at a Cost the Community & Country can afford.

- Health is a fundamental human right, requiring State responsibility and global govt efforts to enhance healthcare services

- Health Care is the preventive, Curative, restorative and promotive Services provided by the official and non-official agencies of a Country to its Citizens.

* Principles and Elements of primary Health Care

Principles of PHC

1. Equitable distribution
2. Community participation
3. Inter Sectorial Co-ordination
4. Appropriate technology.

1. Equitable Distribution

- There Shouldn't be any difference between Caste, Sex, Region, Nationality, Rick, poor, urban, rural Everyone should have facility for Primary Health.

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

- Primary Health Care Strategy focuses on ~~Equity in~~
  - Equity in Health Service distribution
  - Ensuring equal access for all People
  - Regardless of their Eligibity/ability to pay.

2. Community participation

- Involvement of Community, Individual & family is the most essential aspect in Community Health.

- Community involvement in primary health care is Crucial for universal Coverage and promotes social awareness, Self reliance, acceptance and reduced distance between Providers & Consumers

- This involves active participation in planning, implementation and maintainance of Health Services.

3. Inter Sectorial Co-ordination

- In addition to health sector, all related to Health sector involves in it

i.e Development in
- Agriculture
- Fisheries
- Animal husbandry
- Food industry
- Education
- Transport
- Housing
- Public works
- Voluntary agencies
- Communication

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4. Appropriate technology

Healthcare service technology must be appropriate, simple, scientifically sound, adaptable, culturally acceptable, Economically cheaper & operationally convinient.

Technology should be mainly
- Affordable
- Acceptable
- Accessible
- Available

Elements of PHC

1. Education concerning prevailing health problems & methods of preventing & controlling them.
2. Promotion of food supply & proper nutrition
3. Adequate supply of safe water & Basic Sanitation
4. Maternal and child Health Care
5. Immunization against major infectious diseases
6. Prevention & control of locally endemic disease
7. Appropriate treatment of common diseases & injuries
8. Provision of essential drugs.

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

Levels of Health Care

1. Primary Care level
2. Secondary Care level
3. Teritiary Care level

These levels represent different types of care involving varying degrees of complexity.

Primary Care level

- Primary health care providing essential care for individuals, families, and communities.
- This level addresses health problems and ensures effective care based on local need and limitations.
- Primary health care is provided through Primary health centres, village health guides, etc.

Secondary Care level

- Secondary health care focuses on complex problems, typically provided in district hospitals and community Health Centres.

Teritiary Care level

Specialized Hospitals, Apex institutions and India institutes provide Health care at specialized level, Requiring specialized health workers attention.

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* Structure of PHC at Village, Sub-Centre level, PHC & CHC & Rural Hospitals

A. Village level

- This health System Connects with Community through
  - Village Health guides
  - Dai (Traditional Birth attendant)
  - Anganwadi Workers.

- This village level health System Connects / Bridging the gap between the health Sector & the Community.

- Village level working under following schemes
  1. ASHA Scheme
  2. ICDS Scheme
  3. Training of local Dais

ASHA (Accredited Social Health Activist)

- ASHA must be resident of the village a woman, preferable at age 25-45 years with formal Education up to 8th standard.

- Responsibilities :-
  - providing information to Community about Health
  - providing information about Pre & Post Pregancy health
  - Providing information about Minor disease ailments
  - providing information about Proper Sanitization

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

ICDS Scheme (Integrated child development service)

- Integrated child development service is provided by Anganwadi Worker (Selected from Community)

- Responsibilities :-
  - She should undergo training in various aspects of Health, nutrition, child development for 4 months
  - She is expected to serve
  - She should provide services like check-up, immunization, supplementary nutrition, Health Education, etc

Training of Local Dias

- Basic Concepts of maternal & child health, sterilization & obstetric skill
- Training should be Conducted at PHC / MCH / Subs centre

B. Sub centre level

- One Sub-centre for 5000 population - General Population
  one Sub-centre for 3000 population - Hilly tribal & Backward area

- It is Equipped with one male and one female

Service provided - Maternal Health Care
child Health Care
Safe abortion Service
School Health Service
Immunization
Family planning Service

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Prudhvan

C. Primary Health Centre level

- one PHC for 30000 population - In Rural area
  one PHC for 20000 population - In Hilly, tribal & Backward areas

- This Centre provides Curative, Preventive and promotive aspects of Health is Known as PHC

Objectives -
- To provide PHC to the Community through Primary Health Centre
- To achieve & maintain stadard of Quality Care
- To make services more responsive and Sensitive to the needs of the Community

Functions -
- Medical Care OPD services, 24 Emergency services, In patient Service
- Family planning
- Medical termination of Pregnancy.
- Safe water supply & Basic Sanitation
- School health service
- Adolescent health Care
- Prevention & Control of Epidemic diseases
- Education about Health

Staffings in PHC :- Medical officer
Health worker female (HWF)
Health worker male (HWC)
Health assistants (Male & Female)

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PAGE NO. :
DATE : / /

D. Community Health Centre level

- CHC are established to provide the services of
  - specialists in Surgery
  - medicine
  - obstetrics
  - Gynaecology
  - Pediatrics
  - facilities of laboratory, X-Ray & Blood bank

- Community Health Centres (CHC) function as secondary level of Health Care

~~Objective~~ Service delivery in CHC
- Care of routine & Emergency cases in Surgery, medicine
- 24 hour delivery services
- Emergency & Essential obstetric Care
- Safe abortion services
- Delivery of National Health program Services

Other Services - Blood storage Services
Essential laboratory Services
Functional ambulance Round the Clock

E. Rural Hospitals

- It is proposed to upgrade Rural dispensaries to PHC
- PHC's may be shifted to Interior rural areas
- It is proposed to convert the Sub-divisional Hospitals into Sub-divisional Health Centres.

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MOTHER AND CHILD HEALTH CARE

* Objectives of Maternal and Child Care Services

1. Reduction of Maternal and infant Mortality.
2. Promotion of Health and Nutrition
3. Prevention of illness
4. Provision of family planning.
5. Early diagnosis and treatment
6. Promotion of Safe Motherhood
7. Education and awareness
8. Special Care for Vulnerable Groups
9. Improvement of Socioeconomic Factors
10. Integration of Services

These objectives focus on ensuring a holistic and preventive approach to maternal and child health Care.

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

* MCH problems & Enlist the indicators of MCH care

MCH Problems

1. Low Birth weight
2. Malnutrition
3. Infections & parasitosis
4. Accidents & poisoning
5. Behavioural problems

Low Birth weight

- Low Birth weight occurs due to
  - Born prematurely, (short gestation)
  - Fetal growth retardation

- It is most important determinat of its chance of survival, Health growth & development.

Malnutrition

- It is most widespread condition affecting the Health of children

- It occurs due to
  - unsuitable foods
  - lack of purchasing power of family
  - Unknown food given to baby.

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Infections & Parasitic diseases

Young children fall an Easy prey to infectious diseases.
Eg: Diarrhoea, respiratory infections, measles, polio, tetanus, tuberculosis, etc

Accidents & Poisoning

Accidents among children are frequent in the developing Countries, Especially Burns, trauma, poisoning, drowning and traffic accidents

Behavioural changes

Behavioural disturbances are notable child health problem like Adolescence changes, falling of teeth, Reappearing of teeth, etc

Indicators of MCH

1. Maternal Mortality rate

$$\frac{\text{NO. of Maternal deaths in one year}}{\text{Total no. of live birth in Same year}} \times 1000$$

2. Mortality in Infants & childhood

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

a. Perinatal mortality rate

$$\frac{\text{Fetal death (within 7 month \& more) + Early neonatal death (within first week) in one year}}{\text{Total no. of live birth in same year}} \times 1000$$

b. Neonatal mortality rate

$$\frac{\text{No. of children deaths under 28 days in one year}}{\text{Total no. of live Birth in same year}} \times 1000$$

c. Post-neonatal mortality rate

$$\frac{\text{No. of children death between 29 days \& one year age in one year}}{\text{Total no. of live Birth in same year}} \times 1000$$

d. Infant mortality rate

$$\frac{\text{No. of Infant deaths in one year}}{\text{Total no. of live birth in same year}} \times 1000$$

e. 1-4 year mortality rate

$$\frac{\text{No. of children death b/w 1-4 year age in one year}}{\text{Total no. of live birth in same year}} \times 1000$$

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FAMILY WELFARE PROGRAMME

* Demography & Source of demographic statistics in India

Demography

- It is the scientific study of human population
- It focuses attention on
  1. Change in population size (Growth & decline)
  2. Composition of population
  3. Distribution of population in space

- It deals with five "demographic processes"
  - Fertility
  - Mortality
  - Marriage
  - Migration
  - Social mobility.

These five processes are continously at work within a population determining size, composition & distribution.

Sources of demographic statistic in India

1. Census of India:
   Provides information on population size, distribution, age, sex, literacy and occupation.

2. Sample Registration System:
   Provides information on Birth rates, death rates, fertility rates & infant mortality rates

DATE : / /
PAGE NO. :

PAGE NO. :
DATE : / /

3. Civil registration System :-
   - Provides legal recording of Births, deaths & marriage

4. National sample survey
   - Survey Covers a wide range of Socio-economic topics, including population & Health related statistics

5. National Family Health Survey
   Provides detailed data on fertility, mortality, family Planning, maternal and child health

6. Health & Demographic Surveys
   District level Household survey, Reproductive and child Health Survey.

7. International organizations
   Data from global bodies like the world Bank, united nations & WHO

8. Research and Academic institutions
   institutions like ICMR (International Council of medical resea
   IIPS (International institute for Population sciences)

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* Demographic Cycle & life Expectancy

1. First stage (High stationary stage)

- High birth Rate and High death rate
- there population is stationary.

2. Second stage (Early Expanding stage)

Death rate begins to decline and Birth rate Remains Same

3. Third stage (Late Expanding stage)

- Death rate decrease fruther with decreasing birth rate
- Birth exceeds death

4. Fourth stage (Low stationary stage)

- Low birth rate and Low death rate
- there population is stationary

5. Fifth stage (Declining stage)

Population starts to decline Because of lower Birth Rate than Death rate

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO.:
DATE: / /

Life Expectancy

- Given age (of individual) is the average no. of years which a person of that age may expect to live, According to the mortality pattern.

- Life expectancy at birth has continued to increase globally over the years.

- The increase has been more marked in less developed regions of the world than in the developed regions

- Combined life expectency at birth for both sexes was 46.5 years.

* Family Planning

Family planning is defined as " a way of thinking and living that is adopted voluntarily, upon the basis of knowledge, attidues & responsible decisions by individuals & couples, in order to promote the health & welfare of the family group & thus contribute effectively to the social development of a country."

Eligible Couple

Currently married couple wherein the wife is in the reproductive age, which is generally to lie between the ages of 15 and 45

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Target Couple

- Couples who have 2-3 living children are target couple
- Here family planning was largely directed to such couples.

Objectives of family planning

1. Improve Maternal & Child Health
2. Prevent Unwanted pregnancies
3. Promote birth Spacing
4. Control population growth
5. Enhance Quality of life
6. Empower women & Promote gender equality
7. Prevent unsafe Abortions
8. Support Economic development
9. Prevent Reproductive Health problems
10. Strengthen public Health systems.

PAGE NO.:
DATE: / /

PAGE NO. :
DATE : / /

* Problems of Population Explosion

Population Explosion :-

- The growth of the population is so much that the Natural Resources are unable to support and provide the Basic needs, it is described as 'Population Explosion' or 'Population Bomb'

- Reasons for population explosion:
  - High Birth Rate
  - Low Birth Rate

Problems / Hazards

A. Physical Hazards :-
1. Housing
2. Environmental pollution
3. Vector problems

B. Psychological Hazards :-
1. Behavioral disorders
2. Mental illness
3. Anxiety
4. Tension, worries

C. Social Hazards :-
1. Alcoholism
2. Broken homes
3. Corruption
4. Divorces
5. Drug Abuse
6. Gambling.

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D. Antisocial Activities :-
- Theft
- Robbery
- Murder
- Child abuse
- Sex Crime
- Juvenile delinquency

E. Miscellaneous Hazards :-
1. Malnutrition
2. Infections
3. STD's including AIDS
4. Accidents
5. Epidemics
6. Hypertension

National population Policy, 2000

Goal : The attainment of the highest possible level of good health and well being through a preventive and promotive health care orientation in all developmental policies ~~and universal access to~~

This policy is universal access to good Quality Health Care Services without anyone having to face financial hardship as a Consequence.

Objectives :-
To meet unment need of Contraception
To strengthen Health infrastructure
To strengthen Health personnel
To promote integrated service delivery for RCH Care

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO.:
DATE: / /

* Contraceptive Methods
(Fertility Regulating Methods)

- Contraceptive methods are to help women avoid unwanted pregnancies.
- They include all temporary and permanent measures to prevent pregnancy resulting from coitus.

TEMPORARY METHODS

1. Barrier Methods.

a. Physical :-
- Male Condom
- Female Condom
- Diaphragm
- Vaginal Sponge

b. Chemical :-
- Foams
- Creams, Jellies & Pastes
- Suppositories
- Soluble Films

2. Intra uterine Devices (IUD's)

a. Non-medicated :-
- 1st Generation IUD's / Insert IUD's
- 2nd Generation IUD's / Copper IUD's
- 3rd Generation IUD's / Hormone releasing IUD's

b. Medicated

* 1st Gen IUD's :- Lippes loop
2nd Gen IUD's :- Copper 7, Copper T-200, T Cu-380, Nova-T
3rd Gen IUD's :- Progestacert

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3. Hormonal Methods

a. Oral Pills :- (i) Combined Pill
(ii) Progestogen only pill (POP)
(iii) Post Coital Pill
(iv) Once a month (long acting) Pill
(v) Male Pill

b. Depot (Slow release) formulation :- (i) Injectable
(ii) Subcutaneous implants
(iii) Vaginal rings.

4. Post Conceptional Methods / Termination of Pregnancy.

Abortion :- Two types 1. Spontaneous Abortion
2. Induced Abortion

5. Miscellaneous Methods

a. Abstinence
b. Coitus interruptus
c. Safe Period
d. Natural family planning methods
- Basal Body temp Method (BBT)
- Cervical mucus method
- Symptothermic method

e. Breast feeding
f. Birth Control Vaccine

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO.:
DATE: / /

PERMANENT METHODS

- They are also called as 'Sterilization methods'
- There are two methods :- 1. Vasectomy
  2. Tubectomy.

1. Vasectomy :-

- It is the surgical method for men
- A small incision is made in the scrotum on either side above the testes

No Scalpel Vasectomy :- A Newer procedure, instead of incision, a small puncture is made

2. Tubectomy

- It is the surgical method for women
- It consists of Blocking both the fallopian tubes

There are two approches :- 1. Minilaparotomy
2. Laparoscopy.

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PREVENTIVE GERIATRICS

* Health Problems of Aged

They are grouped into Physiological, Psychological social, Pathalogical

Physiological Problems :-

Normally occuring due to aging process, Resulting in disabilities. :-

- Senile Cataract
- Glaucoma
- Nerve deafness
- Ephysema
- Body senses affecting mobility
- Changes in Physical outlook (wrinkles of the skin)

Psychological Problems

- Mental changes :- - Loss of memory
- Decline in Sexual performance resulting in Physical and Emotional disturbances
- Isolation :- - lack of Care by younger generation
  - Social mal-adjustment with younger generation
- Depression :- - Lack of intrest in activities
  - unexplained crying spells
  - inability to Concentrate
  - thoughts of death or suicide
  - changes of appetite & sleep pattern

These factors leading to depression & Isolation

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

Social Problems

- Poverty :- - due to retirement
  - loss of income
  - more Expenditure due to ill Health
- unhealthy lifestyles like Smoking, alcoholism, Etc

Pathalogical problems

- Disease of the Heart & Blood vessels
- Cancer, Diabetes mellitus, obesity.
- Disease of the Eyes
- Disease of Bones & Joints
- Osteoarthritis
- Osteoporosis
- Rheumatoid arthritis
- Diseases of Respiratory System
- Diseases of Genito-urinary System
- Disease of Nervous System.

Prevention & Control measures

Primary Prevention

These are the measures to remain Healthy in old age :

- Control BP, weight, diabetes if present
- Avoid Smoking, Alcohol intake, drug Abuse, Etc.
- Daily Exercise unlocks muscles & rejuvenates old muscles

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- Intake of Balanced diet
- Engage in diverse activities like reading, writing, music etc
- Drink enough water to keep away from renal stones.
- Periodical Screening for BP, Vision & Hearing.
- Building up large circle of friends
- Yoga Exercise & meditation
- Plan for future financial, housing, etc

Specific Protection

All aged must be immunized against diseases such as Influenza, Pneumococcal Pneumonia, tetanus, Hep-B, etc

Immunized selectively against, Hep-A, meningitis, Encephalitis & rabies

Secondary prevention

Early diagnosis & treatment - Since most of the disease of old age are predictable, they are identified by screening & start treatment.

women are educated regarding self-palpation of Breast for presence of lump

Tertiary Prevention

Disability limitation - Intensive treatment for those who come in advance stage of diseases in Hospitals.

Rehabilitation:- training & retraining so they build up Self confidence to care of themselves

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO. :
DATE : / /

* Relation between lifestyle and Healthy aging

Physical Health

1. Nutrition :- A diet rich in fruits, vegetables, whole grains, Protein & Healthy fats supports physical Heath

2. Exercise :- Regular Physical activity improves muscle strength, Bone density & Cardiovascular Health

3. Sleep :- Adequate rest is vital for Cognitive function, Immune health & overall well being.

Mental Health

1. Stree Maingement :- Techniques like mindfulness, meditation and regular relaxation reduce the rick of anxiety, depression, Etc

2. Cognitive Engagement :- lifelong learning, hobbies and problem solving activities keep the Brain active

Social Connections

1. Community Engagement : Maintaining strong relationships and participating in Community activities combat lonliness & improve emotional well being

2. Support System :- Social network provide emotional support and practical assistance

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Environmental factors

1. Access to green spaces: Park & nature promotes physical activity, reduce stress & Enhance mental health

2. Safe living Conditions: A healthy environment minizes Exposure to pollutants and hazards

By Adopting these lifestyle, individuals can significantly Enhance their chances of Aging Healthily.

* Role of Rasayana in Preventive Geriatrics

- Rasayana therapy (Rejuvenation therapy) Plays a significant role in preventive geriatrics
- It is used to enhance longevity, prevent the aging process, and promote overall Health.
- The ideal time for administering Rasayana depends on the individuals Age, Health Condition, & Seasonal Variations

General guidelines

1. Ideal life stage: Around 40-50 years, where vata dominates & degeneration typically begin to manifest

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

PAGE NO.:
DATE: / /

2. Seasonal timing :- शरद ऋतु & वसन्त ऋतु, these seasons are considered the best times for Rasayana as the body is more responsive to detoxification

3. Post-purification (संसर्जन क्रम)
after detoxification, the Body is considered purified and more receptive to the effects of Rasayana

4. Daily Routine timing :- Rasayana drugs are taken on Empty stomach in the morning for Better Absorption

Some of the Rasayana drugs are :-

Acc to mode of Administration :-
1. कुटिप्रवेशित रसायन
2. वातातपीक रसायन

Acc to objective :-
1. काम्य रसायन
2. नैमित्तिक रसायन
3. अजस्रिक रसायन

Acc to effects :-
1. संशोधन रसायन
2. संशमन रसायन

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WORLD HEALTH ORGANIZATION & INTERNATIONAL HEALTH AGENCIES

PAGE NO. :
DATE : / /

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NATIONAL HEALTH PROGRAMMES

PAGE NO. :
DATE : / /

National Leprosy Eradication programme (NLEP)

Objective :- To Eliminate leprosy as public Health problem by reducing the prevalence rate to less than 1 Case Per 10,000 Population

Goals of NLEP :-
1. Reduce the disease Burden
2. Enhance accessibility
3. Promote inclusion & reduce stigma
4. Strengthen Surveillance & monitoring.

Strategies :-
1. Integration of leprosy services into general Healthcare
2. Enhanced Case detection
3. Focus on High-Risk Groups and areas
4. Post-treatment Rehabilitation
5. Partnerships and Collaboration
6. Use of Technology

Plan of Action :-
1. Capacity Building
2. Surveillance and Early detection
3. Awareness and Advocacy
4. Timely treatment
5. Disability prevention & Management
6. Community involvement
7. Monitoring & Evaluation

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National AIDS Control Programme (NACP)

Objective :- To halt and reserve the HIV Epidemic in India by achieving universal access to HIV prevention, treatment, care and support service

Goals of NACP :-
1. Reduce New HIV infections
2. Provide universal access to care & treatment
3. Reduce HIV related stigma & discrimination
4. Eliminate HIV-related deaths

Strategies :-
1. HIV Prevention
2. Treatment and Care
3. Elimination of Mother to child transmission
4. Awareness and Behaviour change Communication
5. Surveillance and Monitoring
6. Partnerships and Community involvement
7. Reducing Stigma and discrimination

Plan of Action :-
1. Strengthen prevention efforts
2. Enhance testing and Early diagnosis
3. universal ART Coverage
4. Focus on vulnerable population
5. Promote Awareness and Education
6. Integrated Services
7. Research & Innovation
8. Monitoring & Evaluation

DATE : / /
PAGE NO. :

Scanned with ACE Scanner

National Programme of Control of Blindness (NPCB)

PAGE NO. :
DATE : / /

Objective :- To reduce the prevalence of Blindness to 0.3% by 2025 and Ensure Comprehensive Eye Care Services to population, especially in underserved areas.

Goals of NPCB :-
1. Reduce the Burden of blindness & visual impairment
2. Enhance accessibility
3. Strengthen Service delivery systems
4. Promote Awareness
5. Integrate eye Care with general Healthcare

Strategies :-
1. Cataract Surgery programs
2. Focus on Refractive errors & School Eye Screening
3. Corneal Blindness Management
4. Strengthen Primary & Secondary Eye Care
5. Control of other Causes of Blindness
6. Training and Capacity Building
7. Community participation
8. use of technology.

Plan of Action :-
1. Service delivery
2. Targeted interventions
3. Public awareness Campaigns
4. Eye Banking
5. Human Resource development
6. Integrated Care Approach
7. Monitoring and Evaluation
8. Research and innovation

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National Pulse Polio Programme

Objective:- To Eliminate Polio in India by achieving 100% immunization Coverage for children under 5 yrs of Age and Ensuring no transmission of wild Poliovirus, Ultimately achieving a Polio-free status for the Country.

Goals:-
1. Eradicate Polio transmission
2. Increase immunization Coverage
3. Sustain a Polio-free status
4. Strengthen Surveillance and Monitoring.

Strategies:-
1. Intensified Polio Vaccination Campaigns
2. House to House Vaccination drives
3. Strengthening Routine immunization
4. Targeted immunization in High Risk Areas
5. Monitoring & Surveillance
6. Community Engagement and awareness
7. Cross-Border Coordination
8. Cold chain and Vaccine logistics

Plan of Action:-
1. National & Sub-National immunization Days
2. Boost Routine immunization
3. Increased Surveillance & Case detection
4. Targeted immunization in Vulnerable populations
5. Health worker training & Capacity Building
6. Regular Monitoring and Data Collection
7. Post-Campaign Evaluation
8. Global and Regional Collaboration

PAGE NO.:
DATE: / /

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National Tuberculosis Elimination Programme

PAGE NO.:
DATE: / /

Objective:- To Eliminate TB as a public Health problem, with the goal of reducing the incidence rate to less than 10 per 100,000 Population, and to Ensure universal access to Quality diagnosis and treatment for all TB patients in India.

Goals :-
1. Eliminate tuberculosis as a Public Health problem
2. Ensure universal Access to Quality TB Care
3. Strengthen TB prevention Efforts
4. Improve diagnosis and Early detection
5. Reduce TB related stigma and discrimination

Strategies :-
1. Active Case finding
2. Universal drug sensitivity testing
3. Strengthening TB diagnosis
4. Treatment for Drug-sensitive & Drug-resisting TB
5. Prevention of TB through Vaccination & infection Control
6. Nutritional Support and Care
7. Public Awareness and Advocacy
8. TB-HIV integration
9. Research and innovation

Plan of Action :-
1. Strengthen TB infrastructure
2. Universal Access to TB diagnosis & treatment
3. Conduct regular Surveillance & Monitoring
4. Community and Stakeholder Engagement
5. Target High-Risk Groups
6. Provide Nutritional and social Support
7. Periodic Evaluation and feedback
8. Global Collaboration

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National Vector Borne Disease Control Programme

objectives:-

To Reduce the Incidence and Mortality of Vector borne diseases through integrated vector management, improved Surveillance, Early diagnosis, treatment and prevention Strategies

Goals :- 1. Reduce the burden of Vector Borne disease
2. Eliminate malaria by 2030
3. Prevent and Control Dengue and chikungunya
4. Lymphatic filariasis Elimination
5. Enhance Surveillance and Early detection
6. Promote Community Participation & Awareness

Strategies :- 1. Integrated Vector management
2. Case management and treatment
3. Surveillance and Monitoring
4. Prevention & Control of Malaria
5. Prevention & Control of Dengue & Chikungunya
6. Lymphatic filariasis Elimination
7. Vaccination for Japanese Encephalitis
8. Community management & Health Education

Plan of Action :- 1. Vector Control measures
2. Strengthen Healthcare Services
3. Surveillance and Early warning Systems
4. Community-Based Vector Control
5. Mass drug administration for filariasis & Malaria
6. Monitoring and Evaluation
7. Inter Sectoral Coordination
8. Research and Capacity Building
9. Public Health Campaign

DATE : / /
PAGE NO. :

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National Reproductive and child Health Program. (RCH)

PAGE NO.:
DATE: / /

Objective :-

To improve the reproductive and child Health status in India By Ensuring accessible, Equitable, and Quality Healthcare Services for women and children, with a focus on reducing maternal and Infant mortality and promoting reproductive heath & family Planning.

Goals :-

1. Reduce Maternal Mortality
2. Reduce Infant and child Mortality
3. Promote family planning
4. Improve reproductive Health
5. Ensure access to skilled care during Pregnancy & delivery
6. Address Adolescent Health

Strategies :-

1. Strengthening Maternal Health Services
2. Improving child Health
3. Family planning services
4. Strengthening institutional deliveries
5. Preventing and Managing Reproductive Health issues
6. Adolescent Health programs
7. Strengthening Health Infrastructure & Human Resources

Plan of Action :-

1. Antenatal and Postnatal Care
2. Institutional delivery & Skilled Birth Attendant Support
3. Immunization and child Health programs
4. Family planning and Contraceptive distribution
5. Prevention and Management of RTI's & STI's
6. Adolescent Health programs
7. Community Based Health workers
8. Monitoring and Evaluation
9. Public Awareness and Advocacy
10. Inter-Sectoral Coordination

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Integrated Child Development Service Program (ICDS)

Objective :- To improve the nutritional and Health status of children under 6yrs of age, Pregnant women, and lactating mothers through the provision of a Comprehensive Package of services, including Health, Nutrition, Education and child Care services with an emphasis on reducing child malnutrition and improving maternal Health

Goals :- 1. Improve Nutritional Status of Children (0-6yrs)
2. Reduce IMR and MMR
3. Improve Health and development of children
4. Promote Health, Hygiene, and Sanitation
5. Ensure Safe growth & development of Pregnant women & Lactating mothers

Strategies :- 1. Provision of Nutrition Supplementation
2. Health and Immunization Services
3. Early childhood Education
4. Maternal Health and Welfare
5. Growth Monitoring & management of Severe Acute Mal-nutrition
6. Awareness & Behaviour change Communication
7. Community participation

Plan of Action :- 1. Strengthening Anganwadi Services
2. Implementation of Nutritional & Supplementary feeding
3. Immunization and Health Care Services
4. Promoting Early Childhood Education
5. Maternal and child Health services
6. Monitoring and Reporting
7. Community outreach and awareness
8. Capacity Building and training
9. Convergence with other programs
10. Evaluation & feedback mechanism.

DATE : / /
PAGE NO. :

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Universal Immunization Programme (UIP)

PAGE NO.:
DATE: / /

Objective:- To protect all children under 5 yrs of Age from Vaccine Preventable diseases by providing free and accessible immunization services across the Country.

Goals:-
1. Achieve High immunization Coverage
2. Reduce Mortality and Morbidity due to vaccine Preventable diseases
3. Achieve full immunization by 2025
4. Eradicate Polio and Elimate measles
5. Improve immunization Coverage in High Risk & undercovered areas

Strategies:-
1. Routine Immunization Service
2. Cold chain Maintenance
3. Use of Innovative delivery mechanisms
4. Public awareness and Advocacy
5. Focus on Strengthening Health Systems
6. Tracking and Monitoring
7. Linkage with other Health programs

Plan of Action:-
1. Vaccination Coverage Expansion
2. Strengthening Cold chain and Vaccine logistics
3. National immunization Days and Intensified Mission Indradhanush (IMI)
4. Monitoring and tracking Systems
5. Promote Safe practices & Reduce Vaccine Hesitancy
6. Capacity Building and training
7. Data Collection and Surveillance
8. Engagement with Private Sector & NGO's
9. Strengthening integration with Maternal Health and family planing programs
10. Periodic Evaluation and feedback

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National Mental Heath Program

Objective:- To provide accessible, affordable, and Quality mental health Care to all Sections of the population, with a focus on promoting mental well-being, preventing mental disorders, and improving the treatment and Care for Individuals Suffering from mental Health Conditions

Goals:- 1. Improvement in Mental Health Care
2. Promotion of Mental well being
3. Access to Affordable Mental Health services
4. Integration of Mental Health into Primary Healthcare
5. Prevention and Early intervention
6. Strengthen mental Health Research & Policy
7. Capacity Building and training.

Strategies:- 1. Integration of Mental Health into primary Health Care
2. Awareness and Education
3. Capacity Building and training of Healthcare providers
4. Mental Health Care for vulnerable groups
5. Community Based Mental Health Services
6. Telemedicine and digital Health
7. Strengthening Mental Health Infrastructure
8. Preventive and promotive interventions
9. Policy research and Data Collection

Plan of Action:- 1. Establishing Mental Health Care facilities
2. Integration into PHC
3. National mental Health Campaigns
4. Training & Capacity Building of Healthcare workers
5. Collaboration with Schools & workplaces
6. Use of technology
7. Data Collection and Monitoring
8. Policy development & Implementation

DATE : / /
PAGE NO. :

National Program for Prevention & Control of Cancer, Diabetes, Cardiovascular ~~Stroke~~ diseases & Stroke (NPCDCS)

PAGE NO.:
DATE: / /

Objective:- To prevent and Control major Non-Communicable diseases by promoting Healthy lifestyles, reducing risk factors, providing early diagnosis and treatment, and Strengthening the Healthcare System to address NCD's effectively.

Goals:-
1. Reduce NCD-related Morbidity and Mortality
2. Promote Healthy lifestyles
3. Strengthen Healthcare Systems for NCD management
4. Improve Accessibility & Affordability of NCD Care
5. Early detection and screening
6. Data and Research for Evidence Based policy.

Strategies:-
1. Community Based awareness and screening
2. Promotion of Healthy lifestyles
3. Strengthening Healthcare infracture
4. Capacity Building of Healthcare professionals
5. Integrating with Existing Health Programs
6. Affordable and Accessible Care
7. Surveillance, Monitoring and Research
8. Collaborations and Partnerships

Plan of Actions:-
1. Awareness and Advocacy
2. Screening and Early detection
3. Strengthening Health facilities
4. Training and Capacity Building
5. Access to Medicines and diagnostics
6. Community Based interventions
7. Monitoring and Surveillance
8. Multi-Sectoral Collaboration
9. Strengthening Referral systems
10. Periodic Evaluation & feedback

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Swacha Bharath Mission

Objective :- To achieve a clean and open defecation free India By improving sanitation, promoting hygiene practice, and Managing solid & liquid waste efficiently.

Goals :-
1. Elimination of open defecation
2. Improved Sanitation Coverage
3. Behavioral change
4. Scientific waste management
5. Urban and Rural sanitation Equity
6. Sustainability of Sanitation infrastructure

Strategies :-
1. Infrastructure development
2. Behaviour change Communication
3. Community Engagement & participation
4. Focus and Marginalized Communities
5. Capacity Building
6. Monitoring and Accountability
7. Convergence with other programs

Plan of Action :-
1. Household toilet Construction
2. Community and Public toilets
3. Solid and liquid waste management
4. Awareness and Education Campaigns
5. School and Institutional Sanitation
6. Monitoring and Evaluation
7. Capacity Building and training
8. Partnerships and Collaboration
9. Sustainability and maintenance
10. Special focus areas

DATE : / /
PAGE NO. :

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Ayushman Bharat Yojana

PAGE NO.:
DATE: / /

Objective:- To provide equitable access to Quality Healthcare services to economically disadvantaged sections of society

Goals:-
1. Financial protection
2. Access to Quality Healthcare
3. Reduction in out of Pocket Expenditure
4. Health infrastructure Strengthening
5. Universal Health Coverage
6. Preventive and Promotive Healthcare

Strategies:-
1. Two Components for Comprehensive Coverage
   - Health & wellness Centres
   - Pradhan Mantri Jan Arogya Yojana (PMJAY)
2. Digital Health infrastructure
3. Empanelment of Hospitals
4. Community participation
5. Comprehensive Benefit Package
6. Portability of Benefits
7. Capacity Building
8. Public-private partnerships

Plan of Action:-
1. Strengthening Primary Healthcare
2. Service delivery
3. Community Engagement
4. Digital Integration

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Ayushman Bharath Digital Mission

objective:- to create a seamless, interoperable digital health ecosystem that ensures equitable access to quality healthcare by leveraging technology.

Goals:- 1. Create a Digital Health Ecosystem
2. Empower citizen
3. Enhance Efficiency and transperancy
4. Fosters innovation
5. Ensure Data security and privacy
6. Strengthen universal Health Coverage

Strategies :- 1. Development of core digital infrastructure
2. Interoperability and integration
3. Citizen Empowerment
4. Data privacy and security
5. Capacity Building and training
6. Public-private partnerships
7. Awarness and outreach
8. Monitoring and Evaluation

Plan of Action:- 1. Creation of Digital Health ID's
2. Establishment of Digital registries
3. Digital Health Record System
4. Telemedicine and e-Heath services
5. Integration with Existing programs
6. Collaboration with stakeholders
7. Data standards and interoperability
8. Privacy and security framework
9. Capacity Building and skill development
10. Monitoring and feedback mechanisms

DATE : / /
PAGE NO. :

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National Heath Mission (NRHM & NUHM)

PAGE NO.:
DATE: / /

Objectives :- National Health system (NHM) includes the NRHM (National Rural Health Mission) & NUHM (National Urbal Health Mission)

- It is to provide accessible, affordable, and Quality healthcare for all, with a special focus on vulnerable and underserved Popupulations

- It aims to strengthen Public Health System to achieve universal health Coverage and improve health outcomes

Goals :-
1. Reduction in maternal and child mortality
2. Control of Communicable & NCD's
3. Universal Access to Healthcare Services
4. Strengthening Health Systems
5. Improved Reproductive, Maternal, Neonatal, child and Adolescent Health.
6. Behavior change and Awareness

Key Strategies of NRHM and NUHM

NRHM (National Rural Health mission)

1. Strengthening Primary Healthcare
2. Reproductive and child Health Services
3. Disease Control programs
4. Capacity Buildings
5. Decentralized Planning
6. Strengthening Referral Systems

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NUHM (National Urban Heath Mission)

1. Strengthening Urban Primary Healthcare
2. Focus on Vulnerable populations
3. Outreach services
4. Integration with urban local Bodies
5. Behavioral change Communication
6. Strengthening Public-Private Partnerships.

Plan of Action:- 1. Service delivery Strengthening
2. Human resources for Health
3. Infrastructure development
4. Community participation & Empowerment
5. Strengthening Maternal & child Health
6. Disease Control and prevention
7. Health management information System
8. Urban Health interventions
9. Behavioral change Communication
10. Monitoring and Evaluation

PAGE NO.:
DATE: / /

Scanned with ACE Scanner

National Ayush Mission

PAGE NO.:
DATE: / /

Objective:- To promote the AYUSH system of medicine to strengthen Healthcare delivery, integrate traditional medicine with mainstream healthcare and improve accessibility, affordability and Quality of AYUSH Services in India.

Goals:- 1. Strengthen AYUSH Healthcare Services
2. Promote AYUSH Education
3. Encourage research and innovation
4. Integration with modern medicine
5. Enhance awareness and utilization

Strategies:- 1. Strengthening Healthcare infrastructure
2. Integration of AYUSH with public Health
3. Capacity Building
4. Research and development
5. Promoting Medicinal plants
6. Information, Education and Communication
7. Public-private partnerships

Plan of Action:- 1. Strengthening AYUSH Healthcare Services
2. Integration with National Health programs
3. Promotion of AYUSH Education
4. Research and Evidence generation
5. Development of Medicinal Plant Sector
6. Capacity Building and training
7. Public awareness and outreach
8. Monitoring and Evaluation

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National Iodine Deficiency Disorder Control Programs (IDD's)

Objective:- To prevent and control Iodine deficiency disorders in India by ensuring adequate Iodine intake through universal Iodization of salt and creating awareness about the importance of Iodine in the diet.

Goals:- 1. Elimination of Iodine deficiency Disorders
2. Achieve Universal salt Iodization
3. Enhance Awareness and Advocacy
4. Monitor and Evaluate Progress
5. Sustain Elimination of IDD's

Strategies:- 1. Universal salt Iodization
2. Public awareness Campaigns
3. Strengthening Monitoring & Surveillance
4. Capacity Building
5. Legislation and Enforcement
6. Partnerships and Collaborations

Plan of Action:- 1. Strengthen salt Iodization infrastructure
2. Monitoring and Quality Control
3. Community Based awareness programs
4. Surveillance and Surveys
5. Advocacy with stakeholders
6. Integration with Health programs
7. Review and feedback Mechanism

PAGE NO.:
DATE: / /

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National Vitamin-A Prophylaxis Program

PAGE NO.:
DATE: / /

Objective:- To prevent and Eliminate Vit-A deficiency and its associated complications, such as night blindness and other ocular disorders, in children under 5 years of age.

Goals:-
1. Prevent Vit-A dificiency Disorders
2. Reduce child Mortality and Morbidity
3. Promote Awareness
4. Achieve universal Coverage

Strategies:-
1. Vit-A Supplementation
2. Integration with Immunization & Health programs
3. Behavior change Communication
4. Capacity Building
5. Monitoring and Surveillance
6. Community Engagement

Plan of Action:-
1. Vit-A Supplementation Schedule
2. Strengthen Service delivery
3. Integrated Health and Nutrition Services
4. Promote dietary diversification
5. Address High Risk groups
6. Monitoring and Reporting.

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National Iron Plus Initiative for Anemia Control

Objective:- To Combat anemia across all age groups, particularly focusing on vulnerable populations such as children, Adolescents, Pregnant women & lactating mothers.

Goals:-
1. Reduce Anemia prevalance
2. Improve overall Health outcomes
3. Promote Behavioral Change
4. Strengthen Delivery System

Strategies:-
1. Life - Cycle Approach
2. Iron & folic acid Supplementation
3. Deworming and infection Control
4. Awareness & Behavior change Communication
5. Capacity Building
6. Covergence with other programs
7. Monitoring and Evaluation

Plan of Action:-
1. Supplementation protocols
2. Mass deworming Campaigns
3. Dietary diversification & fortification
4. Awareness Campaigns
5. Health check-ups and Screening
6. Distribution Mechanisms
7. Monitoring Tools
8. Involvement of Stakeholders.

DATE : / /
PAGE NO. :

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Mid-Day Meal Program

PAGE NO.:
DATE: / /

Objective:- To Enhance the nutritional status of school-aged children and promote universal Education by providing Hot Cooked meals to children in Primary and upperprimary Schools.

Goals:-
1. Improve Nutritional levels
2. Increase Enrollment and attendence
3. Reduce dropout Rates
4. Promote social Equity.
5. Enhance learning Outcomes

Strategies:-
1. Provision of Nutritious meals
2. Community Involvement
3. Health and Hygiene
4. Capacity Building
5. Monitoring and Supervision
6. Convergence with other programs
7. Promote local Sourcing.

Plan of Action:-
1. Meal planning and Nutritional Standards
2. Target Beneficiaries
3. Infrastructure development
4. Health interventions
5. Community Engagement & awareness
6. Use of technology
7. Grievance Redressal Mechanism
8. Emergency preparedness

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Bilwadi Nutrition Program

Objective:- To improve the nutritional status of children aged 3-6 years attending Balwadis (Pre-School Centres) By providing them with Supplementary Nutrition

Goals:- 1. Improve nutritional status
2. Promote Holistic child development
3. Encourage Pre-School attendence
4. Educate Communities on Nutrition

Strategies:- 1. Supplementary Nutrition provision
2. Health and Hygiene Measures
3. Integration with pre-school Education
4. Community participation
5. Monitoring and Evaluation
6. Capacity Building

Plan of Action:- 1. Nutritional Standards
2. Target Beneficiaries
3. Collaboration with ICDS
4. Promote dietary diversity
5. Infrastructure and Resources
6. Health check ups
7. Community Engagement
8. Awareness Campaigns
9. Monitoring and feedback

DATE: / /
PAGE NO.:

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